



SATURDAY, MARCH 20, 1875.

Chimney for the Hinkley Locomotive Works.

There seems to be a prevailing impression that a chimney for any kind of a manufactory must of necessity be a very unsightly structure; we are therefore glad to be able to give our readers engravings showing the design and construction of one which is very neat and graceful, without being any, or at least very much, more expensive than those of the ordinary

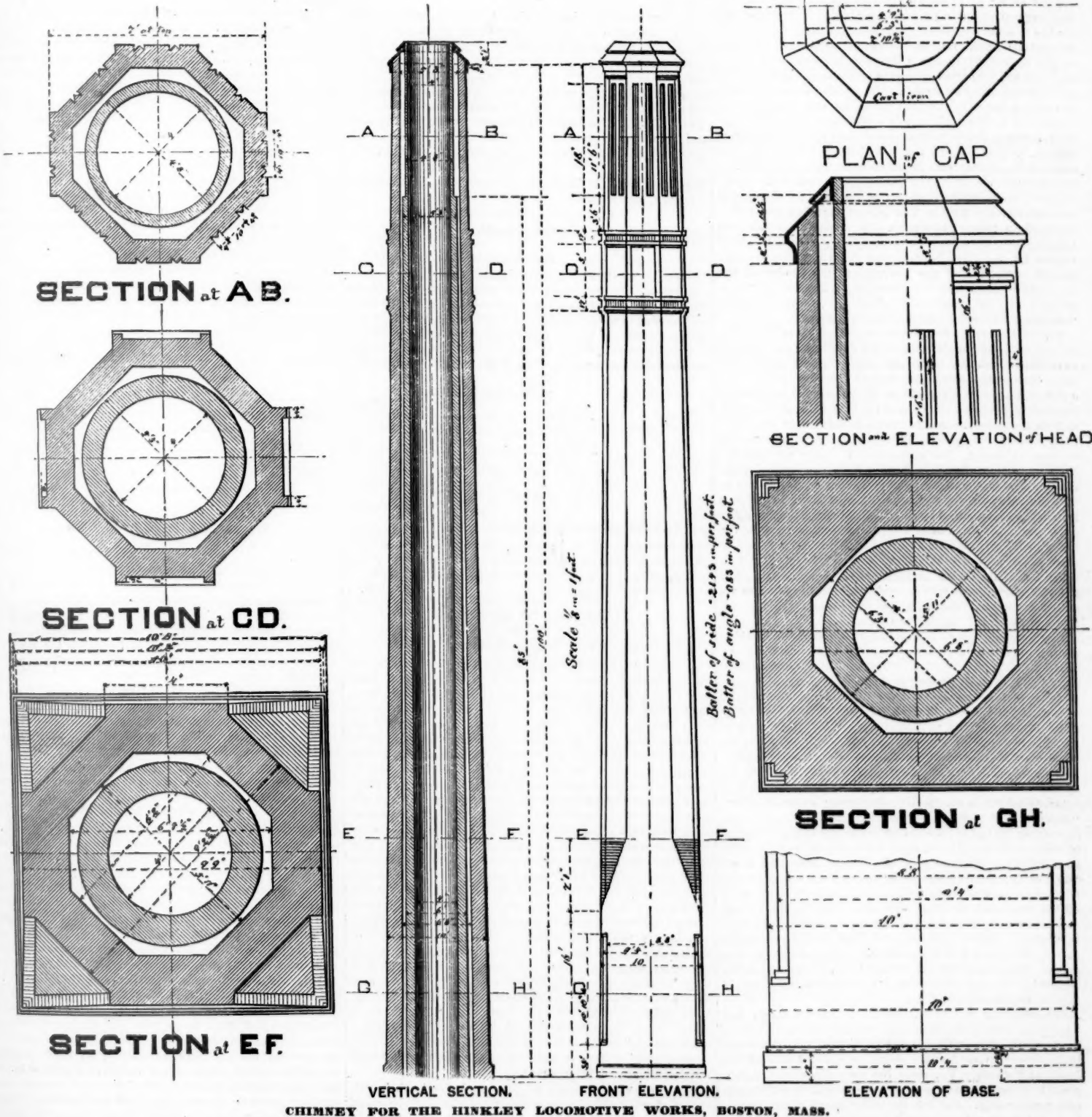
Contributions.

The Lattice Bridge at Springfield, Mass.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice a letter in your issue of February 27 signed by Chas. Bender, C. E., in criticism of the iron lattice bridge at Springfield, Mass., and of lattice bridges in general. The letter seems to have been called forth by a notice of some of the details of the bridge published in a previous number of the *Gazette* and written by a Mr. Bartlett. Mr. Bender calls for more details than were then given, which Mr. Bartlett can doubtless furnish. But some of his questions are already answered by Mr. Bartlett's previous figures, viz.: Mr. Bender asks whether long tons or short tons were spoken of. Mr. Bartlett speaks of the total dead weight as "354,115 lbs., or

scribed tensile strain of 10,000 lbs. per square inch, and consequently we must assume the 12-inch plates to be strained at least equally as much. At the point *a* the diagonal *a c* is added, which throws another strain on the chord *a d*, etc. Now Mr. Bender can hardly be so ignorant of the ordinary rules of bridge-building as to ignore the fact that *new metal* is given to the chord to resist such additional strain, which accumulates with every diagonal in passing from the abutment toward the center of a span. This new metal in the Springfield bridge does not begin directly at the panel point, but far enough in advance of it, i. e., before arriving at the point of attachment of the diagonal, to give room for the proper number of connecting rivets to tax such new chord metal with its quota of the tensile strain, and thereby relieve the vertical plates of a corresponding amount, and enable them, without overstrain, to take up the new



CHIMNEY FOR THE HINKLEY LOCOMOTIVE WORKS, BOSTON, MASS.

pattern. From the engravings, which are so complete that no description is needed, it will be seen that it is built with hollow walls. The inside wall is held in position by occasional projecting bricks from the outside wall. These bear against the former, so that it can expand upward without disturbing the outside. This chimney was built for the new locomotive shop of the Hinkley Works, and was designed, or rather modified from another, the authorship of which we are not able to give, by Mr. Frank D. Child, Superintendent of the above works.

—Mr. A. E. Shrader has resigned his position as General Superintendent of the St. Louis & Southeastern Railway on account of ill health.

—Gen. William L. Dearborn, a well-known civil engineer and for some time past Resident Engineer of the Fourth Avenue Improvement in New York, died in that city, March 16. He was a member of the American Society of Civil Engineers.

177.06 tons," which certainly means short tons, as is customary in this country. But Mr. Bender's chief criticism is this: Speaking of the vertical plates in the chords, he says: "The same plates, therefore, through the whole length of the bridge, are charged with the double office of bearing chord strains and of receiving and transferring the strains caused by rivets in ties and struts." The writer would like to know the difference between these strains here classed as distinct. Mr. Bender himself doubtless would be puzzled to show how a bridge chord can be subject to any strains, as a chord, except through its attachments with the "ties and struts" of the web.

To show how groundless such a criticism is in detail, let us look at the strains in one of these joints in the bottom chord, using the same figure for illustration which Mr. Bender has kindly furnished. Our critic says that any panel, *a b*, "is supposed to be properly designed to have the pre-

strain, viz.: the horizontal component of the strain on the diagonal. In other words, before attaching the new diagonal, the chord is enlarged to an amount equivalent to the demands of the new strain. Mr. Bender will perhaps say that the new metal in the chord should be attached *directly* to the new diagonal, by thickening the vertical plates.

If iron were not an elastic substance, and were incapable of yielding appreciably within safe limits, there might be some sense in such a criticism; but in that case iron would not be a suitable material to build with, and no iron bridge ever yet built would endure long. In making due allowance for such elasticity, it is plain that after passing the point where the new metal is riveted to the chord, such new metal must necessarily bear its share of the chord strains, thereby considerably reducing that strain below the 10,000 lbs. per square inch of section supposed to exist previous to the application of such new

metal. Moreover, there are rivets enough connecting each part of the chord with the rest to render it impossible to strain one part more than another; for every strain is accompanied by an equivalent elongation, and one piece cannot stretch without the others. In fact, when the new diagonal brings the new strain upon the chord, it finds therein a strain considerably less than the maximum of 10,000 lbs. per inch, and the new strain is immediately distributed among all the members of the chord by the rivets provided for that purpose.

In pin and link bridges, a similar criticism would apply and would be answered in the same way. In these bridges an additional link is often introduced in the chord with every panel, but this new link cannot always be placed directly in contact with the new diagonal which brings the new strain to be resisted. In fact, in long spans, the new link is often applied as far as 12 or 15 inches distant, laterally, from the new diagonal, at the end of a pin over two feet long, and this pin has to act as a perfectly rigid beam to carry the strain to the outside links. But the new metal applied to the chords in the Springfield bridge is always within four inches of the diagonal, and connected therewith by rivets ample to transfer and distribute the new strains. Mr. Bender goes on to make a gratuitous and rather uncourteous assumption, that the actual "strains at the circumference of a rivet hole are larger by far than assumed in the calculations of rivet joints." I say gratuitous, because he had not been informed of the basis of calculations actually used in proportioning the joints of this bridge, which was carefully considered, the fact being that I required, as Consulting Engineer of the railroad company, a more conservative limit in this respect than had been before practiced in this neighborhood. The strains on the edges of the rivet holes were limited to 10,000 lbs. per square inch of section for the rivet bearing, and this was not taken as the semi-circumference of the hole, but as the product of the thickness of plate into the diameter of the rivet, giving a strength of joint considerably above that required by the "empirical book rules" alluded to by Mr. Bender.

Mr. Bender goes on to say that in the Springfield bridge the vertical plates and angle irons of the chords are overstrained as compared with the horizontal plates forming the heavier mass, because the former are lighter than the latter. This criticism, like some of the others above referred to, seems to originate in a misapprehension of the true office of the rivets, or from a supposition which has no foundation in fact, viz.: that rivets do not generally fill their holes, and don't amount to much anywhere. The writer is at a loss to see how the lighter members of such a chord can be overstrained while rivetted fast to the larger ones every four or five inches by $\frac{1}{2}$ -inch rivets; for any such overstrain or effort to produce it must be accompanied by an equivalent elongation, or effort at elongation, and this must either transfer this strain to the heavy plates adjoining, or give the chords an arched form in every panel, provided the rivets are of any value. If not of value, i. e., if they move in their holes, they will soon allow the whole structure to tumble to pieces. Neither of these results being the fact, the inevitable conclusion is that the different members act together as a unit.

This supposed defect can also exist in pin-and-link bridge chords, where a light link is often found alongside of a heavy one, depending on perfection of workmanship to strain them equally. That such perfect workmanship is not always attained in practice, any one can see by walking on the chords of several pin-and-link bridges within a hundred and fifty miles of here, where a man's foot can readily shake some of the links in the chord, showing them to be inert, while those alongside of them, bearing on the same pin, must necessarily be overstrained. I am glad to see, however, that Mr. Bender admits such overstrains can occur, either from bad work or inherent defects in pin-and-link structures; unless they have "distinct joint boxes in the chords." His recommendation concerning the use of cast-iron for top chords with joint boxes in every panel, would break up all continuity in the top chords, and end which it has been generally thought important to attain. Such recommendations will not be likely to be generally adopted for railroad bridges until wheels cease to break or get off the track, and all other adventitious strains on bridges can be avoided. To sum up: A well built pin-and-link bridge is, doubtless, better than a poorly-built lattice, supposing each to be equally well-designed in its way; but the writer is among those American engineers who have astonished Mr. Bender by believing well-built lattices a little better yet, having merits peculiar to themselves.

The surest test will be that of time. The old adage, that "the proof of the pudding is in the eating," will apply here in the long run. Our public has yet to learn of a riveted lattice bridge ever having tumbled down, as did the pin-and-link bridge at Waterbury, Vt., some two years since, though supposed to be built on the most scientific principles, and of first-rate workmanship. Nor has the writer heard of any important riveted structure ever having failed and given place to a pin-and-link structure; while the great Crumlin viaduct, at first constructed with pin-and-link bearings on its Warren truss, did so far fail as to warrant the removal of the pin-and-link bearings and the substitution of rivets and gussets. As to the defects which any samples of riveting may have shown, they are as readily explained by alleging poor workmanship or poor design as any of the defects in the pin-and-link structures above alluded to. It is equally unfair and irrelevant to quote either as condemning the whole class to which it belongs, except as indicating the difficulties of attaining a safe and practical result.

Mr. Bender consoles himself by supposing that it will be impossible for riveted bridges to compete commercially with the pin-and-link system on equal conditions. It may be proper for the public to know that the plate and angle iron used in the Springfield bridge was of a quality shown capable of bearing a strain of about 30,000 lbs. per square inch without permanent set, in a series of experiments made by the writer, and

capable of an ultimate strain of over 50,000 lbs., as shown in more recent tests by other parties. Moreover, the Springfield bridge was erected "on commercial principles," after a sharp competition with the pin-and-link men on a similar basis of strength and dimensions. The contract price of the bridge as built was \$242,000, while the lowest bid for a similar pin-and-link bridge was from Clarke, Reeves & Co., at \$246,675, for trusses two feet higher. There was a bid from the builder, Thos. Leighton, at \$235,500, for riveted lattice, of same height of truss as that of Clarke, Reeves & Co.; but there were reasons which appeared sufficient to warrant the extra payment to secure the lower truss, which was built accordingly. As to the floor system, lateral bracing, etc., it is of very substantial character, and free from the annoyance of needing the annual inspection and "screwing up" which is required by all bridges depending on screw attachments in the lateral bracing.

Mr. Bender's sneering allusion to Boston hardly merits reply. It would certainly be a misfortune to our profession, and to the community generally, if, in building any public work, the test of merit were ignored and the choice were to be governed by "fashion," as Mr. Bender intimates. As to the necessity of the West coming to Boston for help, our city has yet no reason to be ashamed of the men she has already sent West. Thus far they seem to be appreciated, and the West will perhaps be quite as likely to go to Boston for more of the same sort as to go to Antwerp, or to Adrianople, Turkey.

EDWARD S. PHILBRICK,

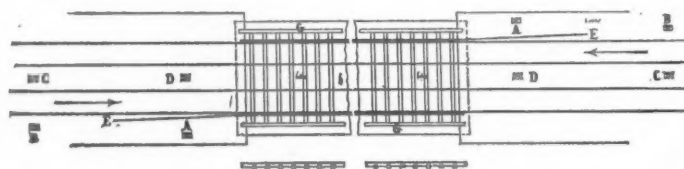
Consulting Engineer for Boston & Albany Railroad Company.
Boston, March 8, 1875.

Bridge Guards.

PHILADELPHIA, February 17, 1875.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Anything, however simple, which tends to prevent accidents on railroads should be of public interest. The sketch herewith shows the method which the Philadelphia, Wilmington & Baltimore Railroad uses to protect its bridges and prevent the now too common accident of bridges being destroyed by the derailment of rolling stock. The posts A and B are to pro-



guard rail E to guide loose wheels, trucks, etc., and the guard tie G to prevent rolling stock, after running off, from getting off the ends of ties and tipping over against the trusses of the bridge, or, in case of deck bridges, from falling overboard.

M. OF W.

Track Work for the Season.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It sometimes happens that track foremen are somewhat exercised in their minds to know what work to take in hand next; not because there is not always enough to do in keeping up track, but that it often requires some thought to decide what may be done that will pay the best. This has reference to that class of men who work for the owners' interest; for be it known there are not a few who care little or nothing for the company's interest, and will take hold of work at random, caring little whether it will benefit the road or not. These men are not wilfully regardless, but they somehow get the idea that it is the amount of work they do rather than the kind, that best pleases their employers. It would be better for the company to pay these men for more brain work and less "main strength and awkwardness." The main thing with some men is to keep busy, show a large amount of work and draw their pay, and there is much work done and paid for that should never have been done. Perhaps at this season there is more labor misapplied on track repairs than at any other, especially in the Northern States. The unusual severity of the weather and the late heavy falls of snow call for extra care and vigilance on the part of road men, and there is no time when labor can be so easily thrown away as now. Of course the roadmaster will give instructions to those that may need them, and see that all labor performed is worth the money it costs. But on those roads that are "too poor" to employ a track superintendent or keep a well-organized road department as a part of their system of management, a great deal of "malpractice" may be expected.

After the winter storms are over and the track is well cleared of snow and ice, the ordinary repairs can be more closely attended to; but they should not be overdone. It may seem a ridiculous idea that track repairs can be "overdone," but this is how it is: Track that is badly disturbed by frost may be brought to a fair surface by the usual process of shimming and cutting down. On roads where there is a fast and heavy traffic it may be advisable to be more particular as to surface than on roads doing a light business, but as a general thing it is not best to cut ties to a great depth late in winter. Where track is heaved into sharp elevations, it is preferable to shim and give easy approaches than to cut down the ties. This, on track well filled, involves great labor in picking away the frozen ballast, and the ties are ruined for future service, and the time that will elapse before the ties will settle to their surface will be short. A safe and steady track may be readily and cheaply made by shimming at such places and when the heaved ties settle to place in the spring the shims can be removed, leaving the rails in good surface and with no destruction of ties. Spike holes should always be plugged and spikes carefully driven, the ties added to a good

track the end posts of bridge from being knocked down; the bearing for the blocks or shims, and the rails well braced up to prevent spreading. It sometimes happens that one rail is badly heaved, while the one opposite is not disturbed, and it is a common practice to cut down the ties on the raised side to bring the rails to a level. This is a bad practice, for besides spoiling the ties it costs far more than it would to raise the lower side on shims, and moreover it gives the road a slovenly appearance to cut away the ties to half their thickness on one or both ends, besides destroying the hold of the spikes. Care should be taken to keep the opposite rails on the same level on straight line and to maintain the proper elevation on curves. If both sides of the track heave alike and rises into a gentle swell, let it alone. It is only the sharp elevations and depressions that need attention, not forgetting the cross section and alignment and keeping the rails to a correct gauge.

While the cold weather continues a sharp eye should be kept out for broken rails, frogs and switch fastenings. The points of frogs frequently break and stay in place for some time before doing mischief. It is best to examine them frequently and tap them with a hammer to make sure there are no dangerous cracks or breaks, or that they are not loose.

It is now time to look ahead and prepare for the spring freshets, which from the present depth of snow we may reasonably expect to be of more than usual severity. Much can be done now to prevent the destructive effects of the rush of waters that must inevitably follow such a storm as prevails at this writing, and which is the third severe storm of the season. Even if this tremendous depth of snow should melt away gradually, it will make trouble by the water overflowing the track and freezing in the cuttings. As soon as the snow is thawed enough to pack it should be cleared out of ditches and small water courses. By doing this in time much damage will be prevented. When the final break-up comes, culverts and bridges should be watched, and floating ice kept from lodging and damming up the streams so as to carry away the structures. Large bodies of ice may be cut and broken up so as to float through culverts and past bridges, that would, if left alone, cause disaster. Watch day and night till the danger is passed.

WM. S. HUNTINGTON.

Co-operation in Railroad Service.

QUINCY, Ill., March 10, 1875.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A late number of your paper, containing an article on "Railroad Management," has attracted much attention hereabouts. If you will allow me, I will make some suggestions relative to the same subject, not because I feel competent to advise or counsel, but because it is frequently the case that hints or suggestions from persons not interested, and in some cases without even the least practical knowledge of the matter under consideration, are worked up by practical men and made available to the world at large.

With possibly a few exceptions men work for either money or position, or both, and if we notice carefully such roads as are in the habit of promoting their employees to better positions as they become fitted for them, we will find that these roads have a far better assortment of men and officers than those roads that make frequent changes.

Good men will often accept positions beneath what they know they are qualified to fill, provided they have a reasonable assurance of promotion, or, in other words, they will "stoop to conquer." Men will work vastly more to the interests of the company when they expect to be employed by the same road as long as they will give satisfaction, with the additional guarantee of promotion.

Of late years it is becoming customary to promote men who are deserving, but it is by no means a universal practice yet. For the past few months it has become quite common for railroads to go into the hands of a receiver, the back pay due employees being paid in monthly installments, according to the financial success of the road during the previous month. In some cases employees have noticed that the business of the road had much to do with the amount of back pay received, and argue thus: as they feel compelled to remain in the service of the road until they receive all their back pay, and as the amount received per month is greater or less according to the financial prosperity of the road, the more business they can draw to the road, and the more that is saved from the usual working expenses and repairs, the larger per cent. they will receive.

Employees about the office manage in various ways to save, and thereby cut down the usual monthly requisitions more or less. The yard men are more careful in handling cars, and consequently fewer draw-bars are knocked out. Cars are not where they are sure to "clear," so the corners will not get cut off; and the switching is generally done in a more economical manner. At the round-house less waste is used. On the road, engineers manage to do with less oil, firemen carry "lighter fires" and fire "finer." The conductor figures to save more time and labor, and the brakemen are more active and energetic. Thus the spirit of economy runs through the several departments of railroad business; each ambitious one striving to gain something for the road, and everywhere that the opportunity presents itself, in some way or other, soliciting business. He also acts as a check on those who are careless or wasteful, until they either become imbued with the same spirit or are discharged for incompetency.

Now why could not a *pro rata* proportion of the net earnings of the road be set apart as a bonus to the men employed, and thus allow them to participate in the profits? By doing this, each man would at once become, to a certain extent, one of the company, and then this feeling that the company is doing well would be at least partly merged into the feeling that we are doing well, and the more we work to the interest of the company the better it is for ourselves.

It should also be understood that unless men were faithful and competent they would be discharged, and on the other hand, that if they gave general satisfaction they would stand in the direct line of promotion.

E. C. CENTRIC.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

Jackson, Lansing & Saginaw.—At the annual meeting in Jackson, Mich., March 3, the following directors were chosen: H. A. Haydon, W. D. Thompson, Jackson, Mich.; O. M. Barnes, M. McRobert, Mason, Mich.; J. F. Joy, Detroit; Newell Barnard, East Saginaw, Mich. The board subsequently elected officers as follows: President, H. A. Haydon, Jackson, Mich.; Secretary, O. M. Barnes, Mason, Mich.; Treasurer, W. D. Thompson, Jackson, Mich.

Geneva, Ithaca & Athens.—The reorganized board has elected Mr. B. A. Packer, President. Mr. Packer is Superintendent of the Pennsylvania and New York road.

Union Pacific.—The new board has re-elected Sidney Dillon, President; Elsha Atkins, Vice-President; E. H. Rollins, Secretary and Treasurer.

Knox & Lincoln.—At the annual meeting in Bath, Me., March 10, the following directors were chosen: John T. Berry, D. W. Chapman, James Clark, Francis Cobb, Edwin Frye, Henry Ingalls, Oliver Moses, Edward Sewall, E. Wilson.

Fall River, Warren & Providence.—At the annual meeting in Providence, R. I., March 9, the following directors were chosen: Thomas P. I. Goddard, James Y. Smith, Providence; Wm. R. Robeson, Henry A. Whitney, Boston; John H. Clifford, New Bedford, Mass. The board elected John H. Clifford, President; Wingate Hayes, Clerk; B. B. Torrey, Treasurer; A. Folsom, Superintendent.

Gulf, Western Texas & Pacific.—Mr. M. D. Monserrat has been appointed Secretary and Treasurer and General Freight and Passenger Agent, in place of H. H. Woodward, deceased.

Minnesota Railroad Commission.—Under the new law abolishing the old commission of three members and substituting a single Commissioner, the Governor of Minnesota has appointed Mr. J. J. Randall, of Winona, to the position. Mr. Randall was a member of the old board.

Burlington & Lamoille.—At the annual meeting in Burlington, Vt., March 3, the following officers were chosen for the ensuing year: President, D. C. Lindsey; Vice-President, Wm. B. Hatch; Treasurer and Secretary, E. W. Peck.

St. Louis & Western.—At the annual meeting in St. Louis, March 2, the following directors were chosen: Chas. L. Hunt, Ed. Burgess, J. B. C. Lucas, S. B. Shaw, B. R. Bonner, Jack Woodburn, Amos H. Shultz.

St. Louis, Kansas City & Northern.—At the annual meeting in St. Louis, March 2, the following directors were chosen: James H. Britton, Robert E. Carr, James B. Eads, Geo. D. Hall, John Jackson, Benjamin W. Lewis, Jr., E. F. Winslow, St. Louis; Wm. Hoge, Solon Humphreys, Joseph A. Jameson, New York. The new directors are Messrs. Hall and Jackson, who replace Thomas A. Scott and R. P. Tansey.

East Tennessee, Virginia & Georgia.—Mr. J. B. Hoxsie, of Knoxville, Tenn., has been appointed Master of Transportation in place of Mr. Hogan, resigned.

Buffalo & Jamestown.—At the annual meeting in Buffalo, N. Y., March 9, the following directors were chosen: Jewett M. Richmond, James Adams, Abraham Altman, James D. Sawyer, William H. H. Newman, Daniel C. Board, Henry Martin, John Wilkeson, Marshall N. Jones, Solomon Scheu, Buffalo; Lemuel S. Jenks, Gowanda, N. Y.; Orsini E. Jones, Alonzo Kent, Jamestown, N. Y.

New York & Oswego Midland.—Mr. J. F. Mackie, late Superintendent of the Southern Division, has been appointed Superintendent of the road from Sidney to Utica and Rome, which the Delaware & Hudson Canal Company is working. The other officers of that company have their authority extended over that section of the Midland. Mr. Mackie's office will be at Norwich, N. Y.

Pittsburgh, Cincinnati & St. Louis.—At the annual meeting in Steubenville, O., March 16, the following directors were chosen: Thomas L. Jewett, Steubenville, O.; D. S. Gray, Columbus, O.; George W. Adams, Dresden, O.; Alfred Gaither, Cincinnati, O.; J. N. McCullough, Wm. Thaw, Pittsburgh, Pa.; Thomas A. Scott, George B. Roberts, Josiah Bacon, Wistar Morris, Strickland Kneass, H. H. Houston, Philadelphia; Robert Sherrard, Jr., New York. Messrs. Bacon and Morris are new directors, replacing Wm. Phillips, deceased, and Hugh J. Jewett. The board re-elected Thomas A. Scott, President, and W. H. Barnes, Secretary.

Dayton & Southeastern.—Mr. Jacob Blickensderfer, of Dayton, O., has been appointed Chief Engineer of this projected road. Mr. Blickensderfer has been prominent in the surveys of the Pacific roads.

Rhode Island Locomotive Works.—Mr. William Corliss has been chosen Treasurer in place of Earl P. Mason, resigned.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Month of January:	1875.	1874.	Inc.	Dec.	P. c.
Albion, Toledo & Santa Fe	\$66,659	\$62,792	\$3,867	9%	
Union Pacific	574,930	630,715	55,785	7%	
Denver & Rio Grande Main Line	20,364	19,530	834	4%	
Its expenses were	13,959	12,112	1,847	15%	
Net earnings	\$6,405	\$7,418	\$1,013	13%	
Earnings of Denver & Rio Grande per mile, 1875, \$170; 1874, \$168. Per cent. of expenses, 1875, 68.55; 1874, 62.02. For the first week in March the earnings were: 1875, \$6,625; 1874, \$5,898; increase, \$727, or 12% per cent.					

Year 1874:
 Atlantic & Pacific.....\$1,360,978
 Pacific of Missouri.....\$1,276,311
 The earnings of the Midland Railway of Canada for the two months ending February 28 were: 1875, \$26,921; 1874, \$28,922; decrease, \$2,001, or 7 per cent.
 The earnings of the Great Western Railway, of Canada, for the week ending February 19th, were: 1875, \$14,442; 1874, \$24,209; decrease, \$9,767, or 40% per cent.
 The earnings of the Grand Trunk Railway, for the week ending February 20th, were: 1875, \$23,400; 1874, \$29,100; decrease, \$5,700, or 17% per cent.

San Francisco wheat shipments in February amounted to 747,139 cents (100 pounds) an increase of 23% per cent. over February, 1875. The flour shipments were 59,800 barrels, a decrease of 44 per cent. Reducing flour to wheat the shipments for the eight months of the crop year, ending February 28th, were: 1874-75, 8,238,600 cents; 1873-74, 7,670,800; increase, 567,800 cents, or 7% per cent.

Produce Movement.

The following figures are from the Produce Exchange Weekly:

Wheat:	1875.	1874.
Visible supply, March 6.....	12,109,533	11,773,459
Lake ports, receipts Feb. 28 to March 6.....	533,693	824,055
Lake ports, shipments same week.....	123,296	400,529
Atlantic ports, receipts.....	283,800	652,750
Atlantic ports, exports.....	458,344
New York, exports.....	385,924	478,563
	1874-75.	1873-74.

San Francisco receipts, July 1 to Feb. 23, sacks.....	7,933,216	6,852,856
Exports, bushels, same time.....	9,806,493	8,611,275
Lake ports, receipts Aug. 1 to March 6.....	41,245,148	56,317,037
" " shipments " ".....	6,714,412	12,982,062
" " shipments " ".....	2,022,943	6,540,835

Corn:	1875.	1874.
Lake ports, receipts Feb. 28 to March 6.....	754,343	507,994
" " shipments same week.....	195,647	143,008
" " receipts Jan. 1 to March 6.....	8,045,927	6,268,236
" " shipments " ".....	3,432,972	1,893,153
Seaboard receipts Feb. 28 to March 6.....	659,915	459,712
" " Jan. 1 to March 6.....	10,562,678	6,421,225
Visible supply March 6.....	7,376,533	6,435,704

Official statements from the various Minnesota companies showed that there was in store on the line of the Minnesota railroads, in warehouses and elevators, March 1, 2,344,740 bushels of wheat.

Flour:	1875.	1874.
Lake ports' receipts, Feb. 28 to March 6, bbls.....	64,402	122,390
" " shipments " ".....	50,734	107,026
" " receipts Jan. 1 to March 6.....	698,026	1,209,740
" " shipments " ".....	679,439	1,088,077
" " receipts Aug. 1 to March 6.....	3,252,066	3,878,898
Seaboard receipts Jan. 1 to March 1.....	1,341,279	2,114,537

Grain of All Kinds:	1875.	1874.
Lake ports' receipts Feb 28 to March 6.....	1,621,938	1,816,223
" " shipments " ".....	476,689	730,470
" " receipts Jan. 1 to March 6.....	18,627,059	24,672,749
" " shipments " ".....	7,460,731	10,879,315
" " receipts Aug. 1 to March 6.....	98,416,021	119,762,188
Seaboard receipts January to March 6.....	16,203,611	18,589,099

It will be seen that the lake ports' receipts, though a quarter less than last year's since January 1, yet exceed the shipments by 11,366,000, against 13,800,000 last year, so that the quantity at the ports to be forwarded is but about a sixth less than last year.

Provisions.—For the packing season, Nov. 1 to March 1:

No. of hogs packed in the West.....	1874-75.	1873-75.
Export of hog products, Nov. 1, to March 1.....	5,723,340	5,466,200
	145,062 tons.	113,211 tons.

Petroleum.—The movement is reported as follows, for the week ending March 6:

	1875.	1874.
Pittsburg receipts of crude, bbls.....	58,869	330,285
Pittsburgh shipments of refined, bbls.....	12,517	87,807
Atlantic exports, gallons.....	3,192,979	
Atlantic exports, Jan. 1 to March 6	25,089,167	35,137,428

The decrease in exports is 28% per cent.

The proportions of exports by the different cities for the two years have been:

	New York.	Philadelphia.	Baltimore.	Boston.
1875.....	69.9	15.6	13.1	1.4
1874.....	69.6	27.6	1.1	1.7

New York thus stands nearly stationary, Philadelphia loses largely and Baltimore gains largely, Baltimore still remaining behind Philadelphia, however.

Mobile Cotton Receipts.—The receipts by the various lines for the six months of the crop year ending March 5 were as follows:

	1874-75.	1873-74.	Inc. or Dec.	P. c.
Mobile & Ohio, bales.....	134,292	156,683	Dec. 22,391	14%
Mobile & Montgomery.....	76,679	37,975	Inc. 38,704	101%
Mobile & Alabama Grand Trunk.....	65	383	Dec. 318	83%
River boats.....	84,729	65,359	Inc. 19,370	29%
Totals.....	295,765	260,400	Inc. 35,365	13%

The increase all comes from the country to the northeast of Mobile, the region due north, which is served by the Mobile & Ohio, showing a considerable decrease, which does not necessarily show a decrease of production, but probably an increase in the northward and eastward movement by rail.

Chicago Traffic.—For the week ending March 13, receipts in Chicago were larger in nearly all articles of produce than for the corresponding week last year—even in wheat. Altogether there were received 59,093 barrels of flour and 949,498 bushels of grain of all kinds this year against 54,201 barrels of flour and 663,605 bushels of grain in 1874. The increase in flour is 9 per cent, and 43 per cent in grain. The difference has so long been the other way that an increase is quite encouraging.

Coal Movement.

The tonnage of bituminous coal over the lines given for the two months ending February 27 was as follows:

	1875.	1874.	Inc. or Dec.	P. c.
Huntingdon & Broad Top.....	38,161	62,065	Dec. 23,904	38%
Clearfield coal over Tyrone.....	134,292	156,683	Dec. 22,391	14%
Div. Pa. R. B.....	108,900	92,318	Inc. 16,582	17%
Penna. & N. Y. (three mo's).....	75,498	54,956	Inc. 20,532	37%
Totals.....	221,940	209,339	Inc. 12,601	6%

The coal traffic of the Chesapeake & Ohio Railroad for the two months ending February 27 was 15,412 tons.

New Rates.

The regular rates from the sea-board cities westward were reduced March 16 by agreement on the basis of a first-class rate of 75 cents from New York to Chicago. The old rates and the new rates are:

	Old Rate	New Rate.
First class.....	\$1 00	\$0 75
Second class.....	90	70
Third class.....	75	60
Fourth class.....	60	45
Special.....	45	35
Coffee, Sugar and Molasses.....	30	30

It is in coffee, sugar and molasses that the Baltimore and Ohio gets the largest westward freight, and this new rate does not leave much room for cutting under.

THE SCRAP HEAP.

Railroad Manufactures.

The Catasqua (Pa.) Rolling Mills have been obliged to stop, being unable to secure a supply of coal.

Thomas Leighton & Co., of Rochester, N. Y., have just completed a double-track iron bridge of 150 feet span over the Lamprey River in New Market, N. H., for the Boston & Maine road.

The Rensselaer Iron Works at Troy, N. Y., have, it is said

an order for 7,000 tons of steel rails for the Grand Trunk of Canada.

The New Albany (Ind.) Rolling Mill Company has voted to increase its capital stock \$200,000.

The Ohio Falls Car Works at Jeffersonville, Ind., has just completed some narrow-gauge cars for the Texas Western road.

A number of the blast furnaces in the Schuylkill and Lehigh regions in Pennsylvania have been compelled to bank the fires or go out of blast, the miners' strike making it impossible to get coal. The rolling mills of those sections have also had much trouble from the same cause.

The Detroit Car Works at Detroit, Mich., have been at work with 250 hands all winter. They recently shipped two passenger coaches and 50 flat cars to the Virginia & Truckee road, and are now at work on an order for the Michigan Central.

Porter, Bell & Co., at Pittsburgh, Pa., turned out in February a narrow-gauge engine for a Utah road, and two mine locomotives. They are now at work on some narrow-gauge engines for a Colorado road, and an engine for a wooden railroad in Texas.

A conference was recently held by the Pittsburgh iron mill owners and representatives of the striking puddlers, but no decisive result was reached. A number of colored men from Richmond have been brought to Pittsburgh and are at work there, taking places vacated by the strikers.

The Joliet steel works are running on full time, carrying about six hundred and twenty-five men, and turning out eight hundred tons of steel rails per week. The blast furnaces will soon be put in and pig iron made, requiring a large increase of the force.

The First Hollow Spoke Cast-Iron Driving Wheel.

The Paterson (N. J.) Press of March 12 says: "A few days ago we quoted some interesting opinions of English civil engineers on the American railway system, being part of a discussion upon a paper read before the Institution of Civil Engineers of England, in which Mr. T. Worsdell, Chief Mechanical Engineer of the London & Northwestern Railway, was quoted as saying:

"The Pennsylvania Railway was, he believed, the first to make cast-iron driving wheels with hollow spokes and rims, which they did with great advantage. He had never known one of the hollow spoke wheels to be broken, except in cases of collision or jumping the track. The spokes answered very well and were exceedingly light."

"A gentleman connected with the Rogers Locomotive Works of this city, being, as he says, unwilling that Paterson should be deprived of any honor justly due her, sends us a bound volume of the *Scientific American*, in the number of which, November 5, 1859, in one of an interesting series of articles on 'The Manufactures of Paterson,' which we recognize as the production of Mr. William Wright, formerly editor of *The Press*, we find a notice of the building of the first locomotive engine—the 'Sandusky'—by the firm of Rogers, Ketchum & Grosvenor, work on which was begun in July, 1835, and completed in October, 1837, having required sixteen months for its construction, 'during which time tools had to be built, experiments made and the men to be instructed.' The 'Sandusky' was furnished with a truck, a single pair of driving-wheels, and cylinders 11 inches in diameter. 'Her weight was 15 tons. At a recent date (this was 1859) she was still in a serviceable condition, the first of a thousand which have since been built at these works.'

"Immediately pertinent to the subject, we find this statement: 'Many valuable improvements were brought out at this establishment for the first time in this country, or indeed anywhere. Among these may be mentioned expansion braces, the counterbalancing of driving-wheels, hollow-spoked cast-iron wheels, the horizontal cylinder and spread truck, &c.' 'From this, Mr. Worsdell would seem to have been in error in his statement that the Pennsylvania Railroad Company was 'the first to make cast-iron driving-wheels with hollow spokes,' and we are very glad to claim for the pioneer of our Paterson locomotive shops the honor of an invention which has received such high commendations from these eminent English engineering experts."

Parting Words.

The Newton (N. J.) Herald during the recent snow storm said: "When a conductor on the Sussex Railroad leaves home in the morning he chucks his wife under the chin and says: 'Have meals at the usual hours, my dear, to-day; our road is short, and we are running careful; I shall endeavor to be prompt. Don't fret.' 'When a conductor on the D. L. & W. leaves home in the morning he looks courageous, and says to his wife: 'Don't be overanxious, deary. I shall bring around in the course of a week.' 'When a conductor on the Midland leaves home he takes her by the hand, and looks pleadingly into her eyes and says: 'You have been a good wife to me, my darling. Don't be in a hurry about marrying a second time. I may get back again if the Chancellor hurries up his work.'"

ANNUAL REPORTS.

Atlantic & Pacific.

This company has made the following statement of the result of the operations of its own and its leased lines for the year ending December 31, 1874:

Atlantic & Pacific:	
Traffic receipts (\$4.140 per mile).....	\$1,360,977 90
Operating expenses (46.97 per cent.).....	637,312 07
Net earnings (\$2.200 per mile).....	\$723,665 83
Income from lands, mineral royalties and investments.....	400,422 50
Total.....	\$1,124,088 33
General expenses and interest.....	918,739 35
Surplus to income account.....	\$265,349 98
Surplus from Missouri Pacific.....	122,522 78
Total surplus.....	\$387,872 73

Comparing the traffic statement with 1873 we find an increase of \$84,666.50, or 6.6 per cent., in earnings; a decrease of \$72,049.04, or 10.1 per cent., in expenses; an increase of \$156,715.54, or 27.7 per cent., in net earnings.

The earnings of the (leased) Pacific Railroad of Missouri were:

Traffic Department.....	\$3,713,452 95
Other sources.....	89,523 71
Total earnings (\$9.276 per mile).....	\$3,802,976 66
Operating expenses (50.47 per cent.).....	2,361,563 97
Net earnings (\$3.769 per mile).....	\$1,441,412 67
Interest, dividends and rentals.....	1,416,989 92
Net profit to lessee.....	\$122,522 73

The increase in gross earnings was \$25,034.95, or 2.6 per cent.; the decrease in working expenses, \$44,333.50, or 1.9 per cent.; the increase in net earnings, \$139,368.25, or 8.3 per cent. The mileage was less in 1874 by 61 miles than in 1873, on account of the surrender of the lease of the St. Louis, Lawrence & Denver.



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Editorial Announcements.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN OPINIONS, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

THE WISCONSIN RAILROADS UNDER THE WISCONSIN LAW.

The Wisconsin railroad law as just amended will doubtless be in force for a year to come, unless the principle be declared unconstitutional by the United States Supreme Court in the case now before it. The amendments passed permit a slight increase in some of the freight charges, which have been estimated in the case of the Milwaukee & St. Paul to amount to about \$60,000 on a year's traffic. The Wisconsin roads, therefore, will have to work under substantially the same restrictions as those which have limited their earnings since September last, but with the further disadvantage that they will be restricted the whole year, whereas last year the law was not enforced until the 1st of October.

If this law applied to all the traffic of the Wisconsin railroads, or even to all the traffic carried on those roads in the State of Wisconsin, it would probably be fatal to both of the great companies of that State within a year or two. Their earnings would not suffice to pay the interest on their debts, and they consequently would have to go into bankruptcy. Fortunately the law applies only to a comparatively small part of the traffic of either of the companies whose rates are most limited. One of these has most and the other much of its mileage of road outside of Wisconsin; and the law does not and cannot be made to cover shipments from one State to another, even when the shipment is made from or to a Wisconsin station. Now, by far the largest part of the Chicago & Northwestern and no small share of the Chicago, Milwaukee & St. Paul traffic goes from the interior to Chicago or from Chicago to the interior. Practically, therefore, the rates fixed by law apply only to that traffic which is shipped from one Wisconsin station to another Wisconsin station. In the case of the Chicago, Milwaukee & St. Paul this is doubtless a very large traffic, but is by no means the whole, and, to some extent, governed largely by the rates which the Chicago & Northwestern makes, it can recover partly on the inter-State shipments what it loses on the Wisconsin shipments.

Thus it is that the great Wisconsin railroads are saved from ruin or a near approach to it only by the fact that the Wisconsin law cannot be generally applied to their traffic. It is not the fault of the law that the companies are solvent.

The officers of the Chicago, Milwaukee & St. Paul Company have made a careful calculation of the decrease in the receipts that would have been caused by the application of the Potter law rates to the traffic of 1873. They find the amounts to be \$271,152 on freight and \$144,657 on

passengers—\$415,809 in all. This is a large sum, to be sure, and is over 7 per cent. of the Wisconsin earnings, but it is only 4½ per cent. of the total earnings, and is about 10 per cent. of the net earnings of that year—too much to lose, but not enough to bankrupt a company of reasonable strength. It is just about 1½ per cent. on the company's stock. During the last quarter of 1874, when the Potter law was enforced, an account was kept of the loss on the traffic, which amounted to \$120,040, by the enforcement of the law. This is, perhaps, better than the average quarter of the year; but the loss, though great, and a large proportion of the total receipts at the legal rates, were yet not a very large proportion of the total receipts of the railroad.

On the Chicago & Northwestern for the same quarter the reduction caused by the law was about 25 per cent. (24 per cent. on passengers and 26 on freight) on the receipts from the traffic affected by the law. Just how much this is we do not know, but if the reduction on the Wisconsin gross earnings was at the same rate as on the Chicago, Milwaukee & St. Paul, it would have been about \$225,000 in 1873, which is less than 2 per cent. of the gross earnings of that year and less than 5 per cent. of the net earnings, and equivalent to less than ½ per cent. on the company's stock. Any reduction is most unjust, for the Wisconsin lines appear not to earn the interest on their bonds, but the Wisconsin earnings affected by the law are so small a proportion of the total earnings that this injustice does not cripple the company, though it makes the Wisconsin lines wholly unprofitable.

Any reduction of earnings, however, is especially injurious to these companies at this time. They are the great wheat roads of the Northwest—the great wheat roads of the country, doubtless—usually carrying to Lake Michigan more than the total wheat exports of the United States. Now, though there was a large crop of wheat last year, the lack of foreign demand caused by the coincidence of extraordinary food crops in Europe and elsewhere in America has greatly reduced the price and diminished the movement of wheat. As we showed a few weeks ago, the wheat receipts at Milwaukee for the first half of the crop year were no less than 44 per cent. smaller than for the corresponding half of the previous year. There is an enormous amount yet to come forward, but it is by no means probable that it will all come forward this year, at present prices, and it is quite certain that the crop west of Wisconsin will be very slow to move unless the rates to the lakes are made as low as possible. Thus the laws of nature and of trade tend to force the railroads to accept lower rather than higher rates for wheat crossing Wisconsin, while the laws of that State force them to accept a lower rate on the shipments from Wisconsin, which can afford to pay a higher rate.

Ordinarily, we may say, the people of the State of Wisconsin have part of the interest on the cost of their railroads paid by the people west of their State. These people do not pay so much for this purpose as do the Wisconsin people for the same amount of service, but as much as they do pay lessens the amount which is chargeable to the Wisconsin people. Let us say that last year they paid one-quarter of the interest on the investment, the Wisconsin people paying three-quarters. Then the rates were so arranged that the trans-Mississippi traffic earned one-quarter of the total net earnings of the roads. If they supplied one-half of the traffic, then the rate of profit was but one-half as great on this as on the Wisconsin traffic. Now, with the lower price of wheat, the question with the railroad companies may be either to take Minnesota and Iowa wheat at a still smaller rate of profit, perhaps not one-half as great as last year, or not to take it at all. In the latter case the trans-Mississippi country would contribute nothing towards the interest on the cost of the Wisconsin roads, and under the operation of natural economical laws, the whole burden would fall on Wisconsin. But the law prevents any increase in Wisconsin profits under any circumstances, so that it will be next to impossible to make up a loss on one branch of traffic by larger profits on another.

It should always be borne in mind that losses by reductions of rates are losses of net as well as of gross earnings. A reduction of a rate, of course, in no way affects the cost of doing the work for which the money is received. This should be obvious enough, but it is often overlooked, and the profits calculated on the assumption that the proportion of expenses to receipts will be the same, whatever may be the rate per ton or passenger per mile. Indeed, the method of stating expenses in percentages of receipts is a thoroughly delusive and misleading one for all purposes of comparison, and its general introduction in railroad calculations the world over has been productive of endless misjudgments. If the cost per ton per mile on a Wisconsin road has been 1½ cents and its charge 2 cents, then a reduction of the rate to 1½ cents deprives the company of half its profits, though there is a reduction of but one-eighth in the rate.

It is probably due to the obstinate and stupid element in the Wisconsin Legislature that the great injustice of

the Potter law was maintained. There is every indication that the intelligent people of the State, and those who make public opinion, were almost unanimous in favor of a radical change. The Commissioners, appointed purposely to study the subject and earnestly favoring some form of governmental control, reported unanimously in favor of such a change. But in a State like Wisconsin no amount of injustice to a railroad corporation is likely to have an unfavorable effect on the fortunes of the legislators who favored it, not because the citizens of Wisconsin are more unjust than others, but because very few of them suffer directly by the misfortunes or the ruin of those who own the railroads. If one of the great companies should become bankrupt to-day, Wisconsin farmers would not feel it and would scarcely know it. So long as the roads earn the smallest amount more than their working expenses, they will continue to be worked; and Wisconsin people can travel and ship their freight as before, should the stock and bondholders never get a cent on their investments. The progress of the State would be arrested to be sure; but the average citizen is not greatly interested in the progress of the State. That, for the most part, in a State like Wisconsin, means new industries and new profits for new men, and at all events the farmer does not easily see, either before or after the event, how this progress benefits him, when once he has been put in easy communication with the great markets. It is this, we believe, which has prevented the repeal of the great injustice of the Potter law, and it tends to prevent any modification of legislation which bears hardly, whether justly or unjustly, on railroad companies. Almost every man in the community is interested in having transportation as cheap as possible; in the Northwest and in most parts of this country, only an insignificant fraction of the community is directly interested in having the railroads earn a fair rate of profit on the capital invested in them. All farmers can understand the burden which transportation charges form; but it is practically impossible to make any considerable number of farmers or of most other members of the community understand how and why a given law affects unjustly the proprietors of railroads. They are, in the first place, not directly enough interested in the question to give the time and trouble necessary to understand it; and in the next place the question is one which is so entirely unfamiliar as to require new methods of study and the knowledge of a whole body of new facts and principles.

WHERE DOES THE MONEY GO TO?

One of the sayings attributed, we believe, to Napoleon was, that "a blunder is worse than a crime." If we leave out of consideration the effect of the crime on the character of the perpetrator, it is doubtless true that the results of a blunder are often more disastrous than those which follow acts that are criminal. The effect which will follow voluntary wrong-doing can usually, to a very great extent, be foreseen, whereas a blunder carries hidden and unsuspected retribution with it. A very forcible sermon could of course be written on the certainty that crime will be followed by bitterness and that its penalties cannot be escaped, but this is not the place to print it, nor we the ones to write it. It is sufficient for our purpose now to establish the truth of the saying in the sense in which we have indicated, and which was probably meant by its author. Its truth, in that sense, may be illustrated in almost any of the ordinary relations of life, but especially in the transactions of business. No matter how good a person's intentions may be, if ignorant of the conditions and limitations by which he is surrounded, he is sure to be wrecked by the dangers which surround all human affairs. All the practices and traditions of business indicate this, and the system of accounts known as "double-entry" is one which has grown up for the purpose of providing a check upon errors which are absolutely certain to occur, and escape detection without such check. In every branch of business a system of accounts is or should be employed to present as clearly as possible the nature of the transactions, and every experienced business man knows the pitfalls which attend all business, and which if neglected become bottomless sloughs that will swallow untold and unknown amounts of money or its equivalent, if no correct record is kept of what goes into them. A merchant must know what his goods cost, not only in the original purchase but also the amount by which that original cost is increased by the attending expenses of doing business; and, if skillful, he is not content with an aggregate, but each distinct expense is kept separate from the rest, so that it can be examined, analyzed and compared.

So with a manufacturer: in order to be able to tell at all times the condition of his business, he must keep an account of the cost of labor, material, rent, repairs, and, perhaps, a hundred other items if the business is a complicated one. In fact, the difference between a competent and an incompetent business man is usually measured by the extent and the accuracy of his knowledge of such facts.

Now while the necessity for such knowledge in univer-

sally acknowledged in all business transactions, quite curiously in the most extensive business which is now or ever has been carried on such minute and detailed knowledge is considered almost unnecessary. While the most rigid accounts have been kept by railroad companies of the receipts from all sources, their managers, as we have heretofore pointed out, have been and are still oblivious to a very great extent of the expenditures, and seem to be quite indifferent as to "where the money goes to." Considering the extremely complicated nature of the business, and the great variety of questions involved in the "value" which is given and received by railroad companies, it would seem that in no business would it be so profitable to keep detailed accounts with a complete system of checks to detect error, neglect or fraud.

To illustrate this, our readers will remember that in the *Railroad Gazette* of January 2 we called attention to the fact that unless railroad companies kept an accurate account of the service performed by car-wheels they were sure to be quite ignorant whether they were using wheels which endure a service of 60,000 or only half that number of miles. Since writing the article referred to we have communicated with a person in charge of the wheel accounts on a leading railroad, on which it was discovered, after keeping a careful report of wheel service for a few months, that the wheels manufactured in the company's foundry ran only about one-fourth as far as those which the company bought from wheel manufacturers. The wheels furnished by some makers did twice as much service as those supplied by others—facts, the value of which was represented by many thousands of dollars, which amounts would in all probability be entirely lost without keeping accurate accounts of wheel service, of which nearly all railroad managers are still profoundly ignorant. This may seem a very exceptional case, and yet we believe there are many other departments in which rigid accounts would reveal similar sources of loss. We have also learned recently that on another road the person in charge of the car department kept an accurate account of the consumption of car brasses, and found that the quantity which required renewal on the axles with small journal bearings was very much larger than on the large journals of the standard car axle adopted by the Master Car-Builders' Association. The same was true of the consumption of oil. Of these facts we expect to give more accurate details hereafter. What we want especially to direct attention to now is the necessity for more detail in keeping the accounts of operating expenses. Quite curiously such a proposition always meets with an immense amount of opposition from all the parties more immediately concerned. Presidents and directors are prone to object on account of the increased clerical expense, which is immediate and tangible, whereas the advantage to be gained thereby is only "the substance of things hoped for." Superintendents object because it makes the affairs more complicated and difficult for them to contain. Master mechanics object for all sorts of reasons, usually because it is "no use" and they know all about it without such "nonsense," which is not "practical;" and there are persons who object for the same reasons that others of their class "love darkness better than light."

However, notwithstanding the static and dynamic difficulties which are interposed, inquiries are being pushed for more light on those things over which darkness has so long reigned. From several different roads we have received intimations of accounts of various kinds which are quietly simmering week by week and month by month, and which at the end of the year promise, in the language of the nursery rhyme, to "make some pretty dishes to lay before the king," whoever it may be, whether stockholders or managers, who exercised the office of sovereignty over railroads.

It would of course be very difficult to indicate with any precision the nature of a system of accounts which would be the best adapted to accomplish the objects indicated above. We believe, however, that it is a subject worthy of the attention of such associations as the Master Mechanics' and Master Car-Builders'. It is of course true that a system might be adopted which would be so elaborate and complicated that the labor and expense of keeping it up would be so great that it would cost more than the information gained would be worth. Some experience will therefore be needed before a system worthy of general adoption can be devised. In the meanwhile, we will endeavor to present to our readers the results of any such experience in this direction as we may be informed of, and will welcome suggestions concerning it from any source worthy of consideration.

We have before us now two of the monthly "Car Reports" made up by Mr. Reuben Wells, Master Mechanic of the Jeffersonville, Madison & Indianapolis Railroad. After experimenting for several months, he has had a blank form printed for that purpose, which we regret we are not able to reproduce. It is printed on a sheet 16x21 inches. On the right-hand side is a blank account of the cars owned by the company, with suitable blanks for keeping account of new cars built and those destroyed during the month.

The following tabular form will give an idea of this portion of the blank:

Cars Belonging to the Company.

First-class passenger cars, ordinary style	
First-class passenger cars, with side seats	
Parlor cars	
Chair cars	
Second-class passenger cars	
Baggage, mail and express cars	
Caboose cars, for carrying passengers and baggage	
Caboose cars, ordinary	
Wrecking cars, box, for carrying tools	
Wrecking cars, platform, for carrying blocking, etc.	
Box cars	
Stock cars	
Coal cars	
Platform cars and cars with temporary coal siding	
Dumping cars	
*New cars built during month	
*Cars condemned and destroyed during month	
*Cars built in place of those destroyed	
Total	

*Six lines are devoted to each of these items.
Another blank contains spaces for filling in the amounts following items consumed for repairs for each of the classes of cars enumerated above:

New wheels.
New axles.
Iron castings, lbs.
Wrought iron, lbs.
Brass bearings, lbs.
Sets of carrying springs.
Draw springs, number of.
Draw bars, new.
Lumber used, feet.
Lubricating oil used, gallons.
Waste used for packing, lbs.
Cars repaired.
Cars rebuilt.
Cars having new roof.
Number of cars that received general repairs during month, including those repaired and roofed.
Number of cars receiving slight repairs.
Condemned and worn-out wheels.
Condemned and worn-out axles.
Scrap brass, lbs.
Wrought-iron scrap condemned, axles included, lbs.
Cast iron scrap exclusive of old wheels, lbs.
Links and pins used on main line and branches during the month, lbs.

Still another blank furnishes spaces for the ordinary expenses of labor, material, oil, waste, cleaning, inspecting, light and fuel; total, and car mileage for the two classes, the one including passenger, mail and express, and the other "freight and all others."

A suitable space is left in which to enter the "cost of repairs, renewals, lifts and pins, oil, waste, inspection, cleaning, light, fuel and all other expenses of passenger cars per mile."

It will be seen that the information which would be given, if all these blanks were filled, would be very complete, and if compared month by month would have great value. Thus in the report for January the quantity of lubricating oil used on the road referred to was 147 gallons for passenger cars and 317 for freight. The mileage of passenger cars was 117,169 miles, so that the consumption of oil was a little over 1.25 gallons per thousand miles for passenger cars and nearly 0.64 gallons per thousand miles of freight cars. The number of pounds of waste used was 104 for passenger and 358 for freight cars, or very nearly the same number of pounds of waste as gallons of oil were used. Links and pins cost very nearly 30 cents per thousand miles run for both passenger and freight cars. The total cost included in the items enumerated was 1.86 cents per mile for passenger cars and 1.13 cents for freight. It is difficult to make any deductions from the cost of other items from a single month's report, but if such reports are kept for a year or more, comparisons will be very useful.

We commend the system adopted by Mr. Wells as being worthy of imitation. It is lacking however, we think, in not having spaces for the shop accounts—that is, the cost of maintenance, etc., of shops, which should be charged to the cost of repairs of cars. Doubtless experience will suggest other additions and changes which should be made before the system will be all that is desired.

In the locomotive department some similar subdivision of accounts would add materially to our information. Thus we have never seen any data which indicated the relative amounts of the cost of repairs of the different parts of locomotives, such as the boiler, the running-gear, the engines proper—that is the cylinders, connections and valve gear—and the tenders. Of course such a subdivision could be indefinitely extended, but even a rough subdivision such as indicated would be very suggestive in enquiries and investigations regarding the cost of operating railroads.

We will be glad to receive any data or suggestions which will throw more light on these subjects.

Interesting Employees in the Profits of their Roads.

A correspondent in an article which we publish this week under the title of "Co-operation in Railroad Service"—himself a railroad employe for many years—makes a most interesting statement of facts in his experience, and trenches on one of the most difficult questions in organized labor in his suggestions. The statement which he makes as to the general efforts towards economy made by employes of companies which have been unable to pay

their debt and have passed into the hands of receivers owing their men for some months' wages deserves to attract attention. In these cases the receivers find the wages of the men to be really the first lien on the road; first-mortgage bondholders cannot foreclose their mortgage without securing this debt for labor, which is the first paid from the proceeds of the foreclosure sale. Thus all earnings above the current working expenses are disposable to pay these overdue wages. Now the effect of this, while this debt continues large, is to make the employes the sole beneficiaries from the profitable operation of the road. If it makes no profits, the men will get none of their back pay; if it makes large profits, they will be paid rapidly. Certainly the men could not well have greater inducements to work efficiently and with economy and to watch against any waste or neglect on the part of others. The important thing in our correspondent's letter is the statement that these inducements have an effect. In discussions of co-operation heretofore, it has been generally thought that where very large bodies of men work together the incitement of a share of the profits would be likely to have little or no effect. Ten thousand men working together in one enterprise in which, perhaps, they may earn for themselves a yearly dividend of a million dollars—a hundred dollars a piece. Now if one man is negligent, he does not suffer by his negligence all the loss it occasions, but only one ten thousandth of it—the rest falls on his fellow-workmen. And again, if the dividend is doubtful, one man may feel that he can do so little that he will not make the effort; others do not do their best, and his fellow-workmen will get most of the advantage of his personal extra exertion.

It is gratifying to hear that in one case at least these obstacles to the effective working of co-operation on a large scale have not prevented its beneficial effects in rendering the average service of the workman more valuable. And it would be extremely interesting to know if the manifestations noticed by our correspondent have been observable on other railroads under similar circumstances. If so, the community may yet have reason to rejoice over the bankruptcy of so many railroad companies. How to render the service of a great corporation as effective and economical as that of men working for themselves is a problem for whose solution the world can afford to pay hundreds of millions; and if we cannot expect that, an approximation to it is still greatly to be desired. We know of one railroad company which for a time made its own car wheels; they cost it considerably more than the best in the market, and, after extended experience and a comparison of exact statistics, it was found that they lasted just about one-fourth as long! No one need be told that on almost every railroad most of the men do much less work than if they were working "for themselves," do their work with less care, and are much less saving of the materials they use. It is in the nature of things—or rather in the nature of man—that this shall be so with the present method of employment and payment. Probably we shall never have a more effective system unless it secures greater faithfulness and industry by enabling the workman to share in the profits of such greater faithfulness and industry. Anything which indicates in the slightest degree the way to such a method deserves the carefullest attention and study.

The Tehuantepec Route.

The isthmus connecting the two great divisions of this continent is by no means the small thing which most of us are apt to think it. Indeed, properly speaking, the Gulf of Mexico is the southern boundary of the division of North America, for by it the breadth of the continent is suddenly reduced from 1,750 to 559 miles, the latter being the distance from the mouth of the Rio Grande to the foot of the Gulf of California. Thus "transcontinental" is a much less formidable term south of Texas than anywhere further north, and especially than in the latitude of our Pacific Railroad line, where the air line is 2,600 miles long. But when we reach the southwestern projection of the Gulf of Mexico, the contraction becomes truly isthmian, and from Vera Cruz in an air line across to the Pacific (such line extending very little west of south), the distance is not more than 225 miles—the distance from New York to Washington, from Detroit to Niagara Falls, from Boston to New York. Just there the difficulty of crossing is immense, to be sure, and the first recognized isthmus of the continent begins about 150 miles further down (southeast) the Gulf coast at the mouth of the Coatzacoalcas River, near Minatitlan, and is known as the Isthmus of Tehuantepec. Here the distance from sea to sea is about 130 English miles. Now from Minatitlan to the Panama Railroad at Aspinwall the distance on a great circle is about 1,109 miles and Aspinwall itself is about 400 miles from the point where South America properly begins. We have thus an isthmus, as we may call it, 1,500 miles long, in an air line, including a little of what is known as North America (in Mexico), and the States of what we call Central America. This long isthmus extends in a direction more east than southeast from Tehuantepec to Panama, the latter place being about 500 miles south, but more than a thousand miles east of the former. That is, Panama is due south of Erie, Pa., and Toronto, Canada, while Tehuantepec, or rather the bay on the Pacific side of the isthmus of Tehuantepec, is due south of Omaha, Neb., and Galveston, Tex.

The coast line on the Pacific side is tolerably straight from Tehuantepec to Panama; on the Atlantic side there are two

RAILROAD EARNINGS IN FEBRUARY.

Name of Road.	Mileage.					Earnings.					Earnings per Mile.	
	1875.	1874.	Ino.	Dec.	Per c.	1875.	1874.	Increase.	Decrease.	Per c.	1875.	1874.
Burlington, Cedar Rapids & Minnesota.	424	424				\$64,685	\$81,213				\$152	\$122
Central Pacific.	1,293	1,260	33		2%	902,000	894,044	\$7,956			698	638
Denver & Rio Grande.	120	120				25,669	18,798	6,871			197	157
Illinois Central.	1,109	1,109				458,158	517,674				413	467
Indianapolis, Bloomington & W'tn.	344	344				96,824	129,394				281	375
Indianapolis, Cincinnati & Lafayette.	179	179				111,577	125,000				623	698
International & Great Northern.	458	407	51		12%	112,500	108,061	4,439			246	266
Kansas Pacific.	761	761				188,495	178,429	10,066			248	234
Missouri, Kansas & Texas.	786	786				205,000	200,371	4,629			261	253
Ohio & Mississippi.	393	393				243,624	243,167	457			620	619
St. Louis, Alton & Terre H., Main Line.	266	266				78,864	83,507				276	313
St. Louis, Alton & Terre H., Branches.	71	71				55,793	57,498	1,705			794	528
St. Louis, Iron Mountain & Southern.	685	685				285,200	217,368	67,832			415	317
Toledo, Peoria & Warsaw.	227	237			10 4%	61,809	82,354				272	393
Totals.	7,116	7,042	84	10	1%	\$2,883,098	\$2,856,786	\$26,312			\$405	\$406
Total increase.			74		1%			26,312				

RAILROAD EARNINGS, TWO MONTHS ENDING FEBRUARY 28.

Name of Road.	Mileage.					Earnings.					Earnings per mile.				
	1875.	1874.	In.	Dec.	Per c.	1875.	1874.	Increase.	Decrease.	Per c.	1875.	1874.	In.	Dec.	Per c.
Burlington, Cedar Rapids & Minn.	424	424				\$170,091	\$189,516				\$401	\$447			10%
Central Pacific.	1,293	1,260	33		2%	1,792,000	1,652,602	\$139,398			1,378	1,312			5%
Denver & Rio Grande.	120	120				44,470	39,432	5,038			371	329			12%
Illinois Central.	1,109	1,109				1,009,692	1,101,671				911	993			8%
Indianapolis, Bloomington & W.	344	344				213,366	281,099				620	817			24%
Indianapolis, Cin. & Lafayette.	179	179				245,304	269,944				1,371	1,508			9%
International & Great Northern.	458	395	63		16%	215,075	239,171				473	605			15%
Kansas Pacific.	761	761				361,232	348,778	12,454			463	453			2%
Missouri, Kansas & Texas.	786	786				421,000	496,707				536	632			15%
Ohio & Mississippi.	393	393				492,874	509,208				1,254	1,296			3%
St. Louis, Alton & T. H., Main Line	266	266				161,740	183,231				609	689			11%
St. Louis, Alton & T. H., Branches	71	71				112,924	76,104	36,820			1,591	1,072			48%
St. Louis, Iron Mountain & So.	685	676	9		1%	551,595	467,442	84,153			805	691			16%
Toledo, Peoria & Warsaw.	227	237			10 4%	133,246	179,148				587	756			22%
Totals.	7,116	7,021	95	10	1%	\$5,924,669	\$6,034,051	\$267,863			\$833	\$859			3%
Total increase or decrease.			95		1%			\$267,863							

great projections of land, the Peninsula of Yucatan and Honduras, the former extending to within about 125 miles to the western extremity of Cuba. In Honduras, about 400 miles east by south from the Tehuantepec isthmus, the Gulf of Honduras approaches within less than 200 miles of the Pacific; at Nicaragua, 400 miles further southeast, a large lake and a river emptying into the Atlantic leave but a very narrow isthmus on the Pacific side, and have tempted many explorations for a canal; a little further south, in Costa Rica, the isthmus has a minimum width of (in an air line) a hundred miles, on which 26 miles of narrow-gauge railroad are in operation, and there we are but about 300 miles from the Isthmus of Panama and the Panama Railroad.

Whenever the question of improving the crossing between the two oceans becomes prominent, as after the discovery of gold in California, the relative situations and advantages of these isthmuses has been generally discussed; but ordinarily most of us think of the isthmus and the various possible crossings of Central America as if confined within very narrow limits. We will do well, then, to remember that from Tehuantepec, the northernmost and westernmost, east by south to Darien, the southernmost and easternmost, the distance is 1,500 miles, in a straight line; and, further, that all South America, except the merest trifles of the west coast, is east of Panama.

Long ago Tehuantepec attracted attention as a desirable route for a canal or a railroad, and for obvious reasons. Compared with the Panama isthmus, on the Atlantic side the Tehuantepec isthmus (say at Minatitlan) is about equally distant from Liverpool and New York—is, indeed, a little more distant, as it is a thousand miles further west and only 600 miles further north. The difference is trifling, however, and of itself would probably make scarcely any difference in the cost of the ocean passage. But for all ports in the Gulf of Mexico, Minatitlan is very much the nearest, being itself a Gulf port and distant but about 800 miles from New Orleans, Mobile and Havana, about 700 miles from Galveston, and, perhaps as important as any, 140 miles from Vera Cruz, the chief port of Mexico. It may indeed be said to be in the neighborhood of Vera Cruz, and so almost in the way of the considerable fleet of steamers and other vessels that visit that port regularly, many of which pass within 70 miles of it now.

But having reached and crossed the Isthmus of Tehuantepec, the situation of the Pacific terminus is very different from that of Panama. It is nearer to San Francisco and other North Pacific ports, and to the China and Japan ports also, by about 1,100 miles, and is further from ports of the west coast of South America by about the same distance, while to Australia the distance is about the same from both isthmuses.

As we have noticed heretofore, the Mexican Government at its last session granted to the Tehuantepec Railway Company, a corporation chartered by the State of Vermont, a concession for a railroad across the Isthmus of Tehuantepec, with various valuable privileges and a subsidy, and that company, which has its office in New York, intends to begin work during the present season. Owing to the numerous surveys which have been made for a canal as well as a railroad, the country is very well known, and the route for a railroad has been well established. Gen. J. G. Barnard, of the Corps of Engineers, Gen. W. H. Sidell, and Captain Sheffield, of our navy, are among those who have made surveys there. It seems to be established that there are no extraordinary difficulties on the route in the way of a railroad, and that most of the country is healthy as well as practicable. The line as surveyed from Minatitlan extends a little west of south to the Pacific at Salinas Cruz, a distance of 162 miles. To the mountain pass,

which is but 680 feet above the level of the sea, the maximum grade westward is 68 feet per mile. At the pass for $3\frac{1}{2}$ miles there is a grade of 116 feet per mile. About 100 miles of the route is on the plains which border the two oceans, and the work there is said to be very light; the intermediate section of 60 miles will require twice as much earthwork.

Besides the railroad, the company proposes to construct harbor works at each terminus, but the estimated cost of the whole is less than \$7,450,000, including steel rails of 56 lbs. per yard, the requisite shops and other buildings, and an equipment of 14 locomotives, 14 first-class, 10 second-class and baggage cars, and 120 freight cars. This is an average of \$45,000 per mile.

To aid in the construction of the line, the Mexican government gives the company the right to import all materials entering into construction and for working the road free of duty for a long term of years, and by way of direct subsidy it agrees to pay the company at the rate of \$7,500 per kilometre (\$12,000 per mile) in paper which will be the sole legal tender for one half of all duties collected at the ports at the termini of the road.

It would seem that such a road ought to succeed if it attracts only a comparatively small part of the traffic now crossing at Panama and by the Pacific railroads. It would make a large extent of country accessible to the gulf ports, and the country near them, which now has practically no intercourse with them. The country on the line of the road is capable of affording a good traffic of itself, and is likely to give considerable, and for almost all inhabited Mexico the road would give the readiest means of communication between districts on the opposite coasts. It would be easy to connect the road with Vera Cruz, and so make it an essential part of the railroad system of Mexico, which, if it remains as orderly as it has been for some years past, is likely to afford a large and growing traffic to the few transportation lines which it has now, or has projected, while the saving of ten or twelve hundred miles in the ocean steamer route from Liverpool and New York to San Francisco and Asia is not to be despised.

Chicago Provision Traffic.

For six years past, from March 1 to the end of February, the number of hogs packed, their average net weight and the average yield of lard have been:

	No. of hogs.	Av. net weight.	Av. lard product.
1874-5	2,136,716	214.26	37.30
1873-4	1,826,680	216.47	37.44
1872-3	1,456,650	236.25	44.02
1871-2	1,229,208	233.42	43.73
1870-1	918,087	225.75	37.94
1869-70	688,140	204.75	39.82

The weight of product, then, would be for the last year just about 270,000 tons, against 229,200 tons the previous year. The number of hogs, live and dressed, received during the year 1874 (the calendar year) was 4,472,687, of which 2,528,108 are reported as shipped. Of the whole receipt, then, about four-ninths appears to have been "manufactured" in Chicago.

For the packing season, November 1 to March 1, the returns have been:

	Hogs, No.	Aggregate wt. lbs.	Lard, lbs.
1870-71	918,087	207,258,138	34,832,210
1871-2	1,218,858	263,285,976	53,300,660
1872-3	1,425,079	336,674,913	67,731,977
1873-4	1,520,024	329,037,479	65,920,413
1874-5	1,600,348	362,177,471	65,082,393

Here we have 212,615 tons the last year against 192,979 tons the year previous. During this season the receipts of product were 3,617 tons against 128,844 tons of shipments, which indicates a stock yet to be shipped of about 92,000 tons more than

the small amount on hand at the opening of the packing season.

Beef packing has become a comparatively unimportant business since the war, but there was a considerable revival during the past year, the number of animals packed having risen from 21,712 in 1873-74 to 41,192 in 1874-75.

Generally provisions are shipped by rail, but the "lake and rail" lines (propeller to Buffalo or Erie, and thence eastward by rail) always take a good deal, and rates must be very low to prevent a large diversion to these lines.

The most encouraging fact in connection with this business this year is the price received for the hogs, which is reported to have been on the average during the packing season, \$6 62½ per hundred, and 38 per cent. more than last year. With a greater production and a very much greater price, the returns have been very satisfactory to Northwestern farmers, and will enable them to become free buyers, and stimulate traffic from Chicago westward. Indeed, the increase in the value of the hog receipts in Chicago seems to have been about \$7,750,000, the whole value of the receipts having been about \$28,000,000. Now this is much greater than the value of the Chicago wheat receipts since the opening of the crop year, and the increase in the value of the hog receipts at Chicago since November 1 is much greater than the decrease in the value of its wheat receipts since August 1, though this decrease has been enormous, the receipts having been much less and at the same time the price much lower. But for the favorable result of the packing season, the prospect for traffic and for business generally in the Northwest would have been extremely dull. As it is, the losses on wheat seem to have been balanced by gains on hogs. Meanwhile the better prices of wheat of late promise to give new activity to that traffic, which has been very light in spite of a large crop to come forward.

Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads, as follows:

Eastern & Amboy.—Extended from Neshanic, N. J., north-westward 18 miles.

Paris & Danville.—Extended from the Vandalia Line at Marshall southward 17 miles to a point within three miles of Hutsonville, Ill.

Chicago & Pacific.—Extended westward 11 miles from Killbuck, Ill., to Rock River at Byron, Ill., 88 miles west of Chicago.

Santa Cruz.—The track is laid on this three-foot-gauge road from Soquel 6 miles toward Santa Cruz, Cal.

This is a total of 52 miles of new railroad.

RAILROAD EARNINGS FOR FEBRUARY are reported by but fourteen companies, with less than a tenth of the total mileage of the country. These companies have 1½ per cent. more mileage than in 1874 and they earned ¼ per cent. more, and the decrease per mile of road is just one dollar. There is only one Chicago road in the list. There are four St. Louis roads, and three others closely connecting with it, so that it may be said to represent St. Louis traffic more than that of any other district. There is no line east of Cincinnati. For the two months the same fourteen roads report, with similar results, though the decrease is larger—3 per cent. in earnings per mile. January earnings were a little larger than February earnings, but not so much so as the month is longer. The average earnings per day of these roads were:

	January.	February.	Dec. '04
1875	\$14 61	\$14 40	\$15 15
1874	13 81	14 50	15 03
Increase.	\$0 80	Dec. '04	

Thus February earnings per day are about 1 per cent. less than January earnings this year, when last year they were 4.7 per cent. greater. The differences are trifling all around. The terrible weather of February and early March has not only limited traffic, but greatly increased expenses.

THE NEW WISCONSIN RAILROAD LAW was finally left in such shape as to have more than its intended effect, because of a mistake in adjusting the bill to existing laws. By the original Potter law the railroads were divided into three classes, "A," "B" and "C," with distinct rates for each, Class A having the lowest rates and Class C being limited only to the rates charged June, 1872. During the last winter a bill was passed putting the roads in the two lower classes into one class, called Class B, with the rates formerly fixed for Class C—that is, four cents per mile for passengers and no more for freight than the companies themselves charged in June, 1872. This was approved March 2, since which time there have been in Wisconsin only classes "A" and "B." Now, the latest law in amendment of the Potter law—the "Quimby bill," as it is called—was passed and approved March 6. It limited the charges of all roads "in classes A and B," giving a little higher rates than were fixed for classes A and B by the original Potter law. Now, as Class B at the time this last bill was passed included all the roads which were last year in the abolished Class C, these latter roads, whose rates heretofore have been very little limited, are now, by the terms of the law, subjected to the rates doubtless really intended only for the roads of next higher grade, the legislators having forgotten that they had changed the classes. The roads in the old Class C were the Milwaukee, Lake Shore & Western, the Mineral Point, the Sheboygan & Fond du Lac and the Wisconsin Valley, all of which need all they can earn at the highest rates they have ever been able to charge. In this will come, too, the new Galena & Southern Wisconsin.

A late telegram says that the Governor and Attorney General have announced their determination to act in accordance with the law the Legislature meant to pass instead of the one they actually did pass; and as this insures the companies against prosecution under the law, they will doubtless take

advantage of the decision of these officials. Thus the railroads of Wisconsin now are placed in two categories: first, the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul and the lines which they work, which may not charge more than three cents per mile for passengers and whose freight rates are limited by the new schedule, which permits somewhat higher rates on certain traffic than were fixed by last year's Potter law; second, all the other roads in Wisconsin, which may charge four cents per mile for passengers and rates for freight not exceeding those which they charged in June, 1872, when there was no law limiting them. This will doubtless be a considerable relief to all the roads in this class which formerly belonged to Class B.

NEW PUBLICATIONS.

Manufacturers' Advertising Books.—We have recently received several publications issued by manufacturing firms as advertisements of their business which have so much merit as to deserve a notice under the above head:

Useful Information for Architects, Engineers and Workers in Wrought Iron, published by the Phoenix Iron Company, consists of a small treatise on the use of wrought-iron beams, posts, etc. in the construction of floors, girders, roofs, bridges, etc. So carefully and thoroughly has this part of the book been prepared that we do not know of any treatise, large or small, which contains so much information about the details of the construction of such work as this small pocket book. It is apparent on reading it that the object which the person who wrote it had in view was to tell the reader how to do what the writer had often done himself. There is none of that vague chaffiness, to coin a word, about it, which is such unsatisfactory and unprofitable reading and which is usually the production of professional book-makers, especially makers of elementary books.

Besides the discussion of the subjects referred to, it contains many useful formulae and tables of the sizes and strength of beams, posts, etc., besides many other useful tables which are usually found in similar books.

Illustrated Catalogue of the Westinghouse Continuous Brake Company.—This admirably prepared work is intended to show the application of this system of brakes to European rolling stock, and, to quote from its preface, "to lay before railway officials and others interested all the information which they may have occasion to ask for, with complete drawings, showing the application of the brakes, and at the same time to illustrate in detail all the parts forming the complete sets of fixtures." This purpose has been very fully carried out, and the volume before us is very elaborately illustrated with lithographs showing the method of applying the Westinghouse system to English engines and carriages, with full descriptions of the methods of doing this and also of the action of the brake, with full reports of trials and experiments made in this country. This "catalogue," which has more the character of a treatise, will undoubtedly do much to enable Europeans to understand and to apply this admirable system and put it into practical use.

General Railroad News.

OLD AND NEW ROADS.

Portland & Ogdensburg.

The stockholders have voted to confirm the agreement of consolidation with the various companies composing the Vermont Division. The Vermont companies have already approved it, so that it is now complete. The consolidated companies will own a line from Portland, Me., to Swanton, Vt., near the foot of Lake Champlain, with a branch from Sheldon, Vt., to the Canada line. It has already secured a lease of the Montreal, Chambly & Sorel road, which will give it a line to Montreal. Of the main line there is yet unfinished a section from Bemis, N. H., to the Connecticut River, and another from Johnsonville, Vt., to Swanton, both partly graded. The consolidated companies will issue \$8,000,000 of first-mortgage bonds, of which \$5,000,000 will be used to take up all outstanding issues, and the remainder to complete the road.

The agreement does not provide for a complete merging, the local companies retaining their organization, but the affairs of the road are all to be managed by a general board, which will have complete control. This general board is to be chosen by the boards of the local companies.

Macon & Brunswick.

The Governor of Georgia has approved the resolutions passed by the Legislature affirming the validity of the State endorsement on \$1,950,000 first-mortgage bonds of the company.

Port Royal.

The bondholders met in New York March 16, to consider measures for the protection of their interests. There was a long discussion, but no action was taken except to appoint a committee to consider what is best to be done, and report at a future meeting.

Paducah & Memphis.

It is stated that, if the necessary legislation can be secured, this company will be consolidated with the Mississippi & Tennessee. It is understood that the control of the company has already been secured by Col. McComb and other parties connected with the New Orleans, St. Louis & Chicago. The consolidated road, when completed, would extend from Grenada, Miss., north to Memphis, Tenn., and thence north by east to Paducah, Ky. It is all built except a gap of about 50 miles between Covington, Tenn., and Trimble, which is partly graded.

Pittsburgh, Cincinnati & St. Louis.

At the annual meeting in Steubenville, O., March 16, adopted resolutions declaring that the income was insufficient to pay the principal and interest of the \$5,000,000 second-mortgage bonds due April 1, 1875, and authorizing a new issue of \$10,000,000 income bonds secured by mortgage and having 50 years to run, for the purpose of funding the second-mortgage bonds and accrued interest and of increasing the facilities of the road for business. A resolution was also adopted approving the action of the board in beginning proceedings against the Columbus, Chicago & Indiana Central Company to enforce the performance of contract.

The Storm and the Floods.

The winter storms are not yet over, for the telegraph reported, March 17, heavy snow storms in Iowa and Nebraska, and the roads west and north of Chicago were badly block-

aded, and trains running very irregularly, and in some cases not at all.

On the other hand, extensive damage has been done by spring floods in New York and Pennsylvania, mainly on the upper waters of the Delaware and Susquehanna. March 16, the fine iron bridge over the Susquehanna at Pittston, Pa., on the Lackawanna & Bloomsburg road, was carried partly away, losing three spans, and several other bridges were carried away or damaged. The Erie road was broken on the same day by the sweeping away of the bridge over the Delaware at Saw Mill Rift, above Port Jervis, and many minor losses are reported, probably only a beginning of what is to come.

Meetings.

The following companies will hold their annual meetings at the times and places given:

Long Island, at the company's office in Long Island City, N. Y., April 13, at 12 noon.

Pacific of Missouri, at the company's office, No. 25 South Fourth street, St. Louis, March 29.

Morris Canal, at the office in Jersey City, April 5, at 1 p. m.

Allegheny Valley, at the company's office in Pittsburgh, Pa., April 13, at 11 a. m.

A special meeting of the stockholders of the Louisville, Paducah & Southwestern Company will be held in Louisville, Ky., March 24.

Southwestern & Rio Grande.

The District Court has granted the application of this company, and has ordered a peremptory mandamus to issue to compel the city officers of Shreveport, La., to collect and pay over to the company the tax of \$300,000 voted in aid of the road.

Dividends.

Dividends have been declared by the following companies:

Panama, 3 per cent., quarterly, payable April 15.

Dubuque & Sioux City (leased by Illinois Central), 2½ per cent., payable April 1.

Western Union Telegraph, 2 per cent., quarterly, payable April 15.

New York & Harlem, 2 per cent. from the earnings of the city lines, payable April 1.

The Hoosac Tunnel Line.

The directors of the Fitchburg Railroad Company have presented a memorial to the Legislature in which they set forth their willingness to recommend the stockholders to vote to confirm a consolidation with the State road, a lease of the road to the State or to a consolidated corporation or a sale to the State. If the toll-gate plan is adopted, or if the State retains its own road and the tunnel and works them itself, they are ready to co-operate with either plan.

The Wisconsin Railroad Law.

The increase of rates allowed by the new law is estimated at about 8 per cent. No increase is allowed for distances under 50 miles, while for greater distances it varies slightly. The rates allowed on grain and lumber, compared with those under the Potter law and those under the tariff of June, 1873, are as follows:

Grain:	Tariff 1873.	Potter law.	New Rates.
For 50 miles, per car load.....	\$14	\$10	\$10
For 75 miles.....	17	12	13
For 100 miles.....	19	14	15
For 125 miles.....	21	16	17
For 150 miles.....	23	18	19
Lumber:			
For 50 miles.....	18	13	13
For 75 miles.....	19	15	16
For 100 miles.....	21	17	18
For 125 miles.....	24	19	20
For 150 miles.....	26	21	22

The largest increase here is 8½ per cent., and the smallest less than 5 per cent., so the average must be much less than 8 per cent.

Chesapeake & Ohio.

It is stated that the company has succeeded in settling matters with the holders of Virginia Central bonds, who recently had that portion of the road, which formed the old Virginia Central, advertised for sale. The notice of sale has been withdrawn.

Pennsylvania.

The committee appointed at the stockholders' meeting to prepare a ticket to be voted for at the coming election has agreed to recommend the re-election of the present board, Col. Thomas A. Scott, Wistar Morris, Thomas A. Biddle, N. P. Shortridge, John Scott, Josiah Bacon, John M. Kennedy, Henry M. Phillips, Samuel M. Felton and A. J. Derbyshire.

Erie.

The loss of the bridge over the Delaware above Port Jervis has interrupted travel for a time, but it is thought that a temporary bridge can be put up in a week or ten days which will carry trains until a permanent structure can be built to replace the one carried away by the flood. One span out of five is left, and it is thought that all the piers are uninjured. Meantime, through trains are run over the Delaware, Lackawanna & Western between Binghamton and the Bergen Tunnel, so that there is no stoppage of through business.

The Railroad War.

There has been made public a correspondence between President Jewett of the Erie and President Scott of the Pennsylvania, which is very much the same as that between Presidents Jewett and Garrett, heretofore published, except that Mr. Scott professed his willingness to accept Mr. Jewett's proposal of arbitration, while Mr. Garrett declined it.

Illinois Central.

The company has issued the following notice to its employees:

"Hereafter no compensation will be allowed to officers or employees who may be injured in the service of this company, when such injuries have been caused by a violation of its rules and regulations, or by carelessness or want of proper precaution on the part of the parties injured. In coupling cars, if a stick or hook is used instead of the hand to guide the link, and if proper caution is observed, there will be no accidents from this cause. Getting feet fastened in frogs and falling on the track result from attempting to place links and pins in drawbars while cars are in motion, and not unfrequently walking backwards while doing so. Scarcely an instance occurs in train service, where men are hurt, that if proper care had been observed the accident would not have been averted. An employee who does not use prudence and take proper precautions to guard himself against injury cannot be trusted to take care of this company's property. All such must be dropped from the service. Every application for a donation or claim for compensation from injured employees must rest upon its own merits, and be accompanied by a report from the head of the department in which the person was employed, setting forth all the facts and circumstances connected with such injury."

Springfield & Illinois Southeastern.

The directors of the Ohio & Mississippi Railway Company have voted to confirm the purchase of this road by their company from the bondholders who purchased it at the recent foreclosure sale. The price paid is to be, as heretofore stated, \$1,750,000, payable in bonds.

A new mortgage for \$3,000,000 on the road has been executed, to secure the same amount of bonds having 30 years

to run, the coupons for two years to be funded at the option of the Ohio & Mississippi Company. Of these bonds the sum of \$1,750,000 is to be issued in payment for the road, while the remaining \$1,250,000 will be issued from time to time as needed to provide means for improving the road, increasing the equipment and building a branch to the coal and mineral lands of Hardin County. The mortgage is at the rate of about \$13,500 per mile.

The Ohio & Mississippi took possession March 1, and the road will be hereafter known as the Springfield Division of that road. The old officers are continued in office with Mr. C. A. Beecher as General Manager.

Hempstead & New York.

This road, from Hempstead, N. Y., to Valley Stream, has for some time past been worked as a branch by the Southern Railroad Company of Long Island, and its present owner is the trustee for the bondholders. Snows and floods have brought the road into such a condition that it is no longer safe to run trains over it; the owners decline to advance the money to repair it, and the Southern Company has therefore ceased to operate it, being unwilling to spend any money on it unless secure of repayment. It will probably remain closed for some time.

Cairo & St. Louis.

The injunction suits restraining Cairo City and Alexander County from paying over bonds voted to this road have been withdrawn, and the road being finished, the bonds, amounting to \$117,000, have been turned over to the company.

New York & Oswego Midland.

The following order has been issued by the Delaware & Hudson Canal Company, dated March 9, 1875, and signed by Thomas Dickson, President.

"For the purpose of supplying coal and the partial forwarding of freight and passengers, this company, under an arrangement with the receivers of the New York & Oswego Midland Railroad Company, are to operate temporarily that portion of the line between Sidney, Rome and Utica; the understanding being that the arrangement may be terminated by either party at an hour's notice. The road, therefore, will be operated for the present for the purpose of transporting the coal of this company and moving such other freight as they may deem expedient.

"The employees who have been in the service of the receivers, or such of them as may be required, will have the preference over new men in the business contemplated.

"All communications relating to the business of the road should be addressed to C. F. Young, General Manager, Honesdale, Pa., or to H. V. Olyphant, Assistant President, Albany, N. Y.

A force of men was at work last week clearing up the road, and trains were expected to begin running this week.

The committee of five appointed at a bondholders' meeting some time since has prepared a plan for the reorganization of the company, which is to be submitted to the bondholders. This plan provides for five classes of bonds and two of stock, and briefly summarized is as follows:

Preferred first-mortgage bonds to be issued and sold, to supply means needed for the completion of the road.

General first-mortgage bonds to be issued to holders of present first-mortgage bonds and receivers' certificates.

Currency first income bonds to be exchanged for present second-mortgage bonds.

Currency second income bonds to be exchanged for equipment, consolidated and Western Extension bonds.

Currency third income bonds to be exchanged for convertible bonds and unsecured debt claims.

Preferred stock to be exchanged for the present stock after dividends are paid on the common stock, and to be represented meantime by non-interest bearing convertible bonds.

Common stock to be issued with the general first-mortgage bonds and to the holders thereof.

The general defect of this plan appears to be that it loads the road with funded debts on which there is very little prospect that it will ever be able to pay interest.

Gulf, Western Texas & Pacific.

The following order has been issued by Mr. Richard J. Evans, President and Superintendent, under date of March 1:

"After full consideration the company has determined to issue no annual or other than single trip passes over their railway, and I am instructed by the Executive Committee to revoke all such passes issued previous to the receipt of their instructions.

"Annual cards hereafter presented to the conductor will be considered as passes for the single trip and will be taken up and returned to the General Passenger Agent with the receipts of the day."

Northern Pacific.

Orders have been given to prepare for reopening the Dakota Division, from Fargo to Bismarck, so that trains can begin to run to Bismarck about March 15.

Detroit, Hillsdale & Indiana.

No trains have been run over this road since the sale in December, and it is completely snowed under.

Paris & Danville.

The track on the extension of this road southward is laid to a point about three miles north of Hutensville, Ill., and 17 miles south of the late terminus at Marshall.

Rochester & State Line.

The City of Rochester has refused to change the character of the bonds voted to this road as requested by the company, or to make any additional subscription.

Easton & Amboy.

At the Musconetcong Tunnel there remains only about 300 feet of bottom to be taken out, to make the tunnel of full size the whole way through. Work on the arching where it is needed will then be pushed forward.

The track has been extended from Neshanic northwest 18 miles to a point 2½ miles east of the tunnel, where there is a cut and fill yet unfinished. The second track has been laid from Perth Amboy nearly to Bound Brook.

On the western end the grading is finished from Phillipsburg to the tunnel, and work has been begun on the bridge over the Morris Canal at Port Delaware.

New Jersey Midland.

There has been put upon record a chattel mortgage, covering all the equipment and movable property, to B. P. Terhune and S. E. Olmstead, trustees for a number of preferred creditors, whose claims amount to \$90,358.

The Receiver, Mr. Hobart, is taking steps to put the road in good condition. For the present the train-service has been reduced to correspond with the business and the immediate necessities of the road. As soon as possible arrangements will be made to pay off the wages due, and a statement of the condition of affairs will be prepared.

An effort is to be made to have a receiver appointed in New York, so that the (leased) line from Unionville to Middletown may be worked without the present embarrassments.

North Carolina.

The North Carolina Supreme Court gave a decision, March 11, sustaining the validity of the lease of the North Carolina Railroad to the Richmond & Danville Company, and also affirming the right of the lessee to change the gauge of the road, and dissolving the injunction against such change.

Immediately on the receipt of the decision arrangements were made to change the gauge of the road from Greensboro

to Charlotte from 4 feet 8 1/2 inches to 5 feet. It was intended to have the change completed by March 17, when cars could run through from Richmond to Atlanta without change.

It is not known whether any change of gauge will be made between Greensboro and Goldsboro, but nothing is to be done at present.

Pithole Valley.

This road was sold at sheriff's sale recently under a judgment for \$570, and was bought for \$590 by Edgar Huidekoper, of Meadville, who is said to have bought it on behalf of the Pennsylvania Petroleum Railroad Company. The road is 7 miles long, from Pithole, Pa., to Oleopolis.

Nevada Central.

This road is to be sold at sheriff's sale, March 22, under a judgment for \$2,029. It is 18 miles long, from Pioche, N. V., to Bullionville, is of 3 feet gauge and is used mainly for hauling ore. We have spoken of it heretofore as the "Pioche & Bullionville" Railroad.

Utica, Ithaca & Elmira.

The original intention was to build this road down University Hill into the village of Ithaca, but so much opposition was encountered that the directors have resolved to build it on what is called the Murdoch line, which passes around Ithaca, making the junction between the two divisions outside of the village. A station will be established at the nearest point to Ithaca.

Central Valley.

The running of trains on this narrow-gauge road has been suspended and the road abandoned for the present. It is 12 miles long, from the Utica, Chenango & Susquehanna Valley road at Central Valley, N. Y., to Smithville.

Chicago, Danville & Vincennes.

A number of bondholders have issued a call for a meeting to be held in the Drexel Building, Wall street, New York, March 19, for consultation as to the interest of the bondholders.

A meeting of bondholders resident in Baltimore and vicinity was held in that city, March 10, to consider their best course in view of the recent appointment of receivers for the road. A communication was received from the President of the company protesting against the order of the Court and requesting their views. The meeting adopted a preamble and resolutions stating that they believe the best interests of all the bondholders and other creditors of the company will be promoted by placing its property in the hands of the receivers appointed—Henry B. Hammond and John B. Brown.

Western North Carolina.

The North Carolina Legislature has passed a law appointing Governor Brogden, President Armfield of the Senate and Speaker Robinson of the House Commissioners to buy in this road on behalf of the State at the foreclosure sale which is to take place in May next. The price to be paid is limited to \$850,000. The intention is that the State shall then complete it to the Tennessee line, using convict labor.

Boston, Clinton & Fitchburg.

A short branch is to be built from Clinton, Mass., north to the Lancaster Mills. It is intended to accommodate the traffic of several large mills.

Reading & Lehigh.

This road has been leased to the Philadelphia & Reading Company for a term of 99 years, but the terms of the lease are not made public. They will probably be announced when the lease is submitted to the stockholders for ratification.

The road, formerly known as the Berks County, is 44 miles long, from Reading, Pa., northward to the Lehigh Valley at Slatington. It was intended as an extension of the Wilmington & Reading and also to bring Lehigh coal to Reading in competition with the Philadelphia & Reading. The original company became bankrupt and the road was sold at sheriff's sale a few months since and bought in by the creditors, who organized a new company.

The road will be known hereafter as the Berks & Lehigh Branch of the Philadelphia & Reading Railroad, that company having taken possession.

Los Angeles & Independence.

The company has put a force of 200 men at work grading the road through the Cajon Pass. This work has been begun in order to prevent the Southern Pacific people from taking possession of the Pass. Work is also in progress between Los Angeles and Truxton.

Santa Cruz.

The grading is well advanced. The bridge at Aptos Creek is finished, and the Valencia and San Lorenzo bridges are well advanced. Nearly all the iron has been received and the rest is on the way. The track is laid for six miles from Soquel, Cal., and the tracklayers are going ahead as fast as the bridge work will allow them.

Albany & Susquehanna.

The trustees of the sinking fund and equipment mortgage of May 1, 1869, have designated by lot for redemption 100 bonds, which will be paid with interest to May 1, 1875, on presentation at the office in Albany, N. Y. The numbers of the bonds are: 2, 3, 7, 12, 18, 19, 27, 28, 42, 46, 47, 65, 71, 78, 79, 96, 125, 135, 138, 139, 141, 157, 158, 165, 169, 210, 222, 245, 246, 252, 269, 270, 271, 274, 282, 294, 356, 465, 414, 424, 425, 427, 438, 472, 487, 520, 532, 556, 558, 574, 585, 592, 597, 600, 605, 608, 620, 622, 625, 627, 638, 642, 645, 650, 654, 656, 666, 674, 676, 683, 691, 699, 732, 773, 783, 809, 824, 826, 829, 834, 839, 846, 862, 865, 878, 883, 895, 896, 901, 908, 915, 916, 922, 949, 957, 976, 983, 984, 920.

Louisville & Nashville.

Much damage has been done to the Memphis Branch by freshets, and trains have had to be suspended for a week. Meantime trains are sent round by way of Nashville and McKenzie, using the Nashville, Chattanooga & St. Louis from Nashville to McKenzie. The breaks are being repaired as fast as possible.

Atlantic, Tennessee & Ohio.

The court has made an order vacating the receivership, and the road has been turned over to the President of the company, Col. Myers. This is in accordance with a compromise agreement made recently between the company and the creditors.

Grand Trunk.

In addition to the contracts for 95,000 tons of coal for the western end of the road, which will come mainly from Pennsylvania and Ohio, this company has contracted for 60,000 tons to be delivered at Montreal during the ensuing year, which is to come from the mines about Pictou, Nova Scotia. This company has leased the Jacques Cartier hotel property in Montreal, and the building will be fitted up for the general offices of the company, instead of rebuilding those recently burned at Point St. Charles.

Plymouth, Kankakee & Pacific.

Some years since Kankakee County, Ill., issued bonds in aid of the Kankakee & Illinois River road which was afterwards consolidated with the Plymouth, Kankakee and Pacific. The road has never been completed and the county refused payment of the interest on the ground that the consolidation was invalid. The United States Circuit Court has given judgment against the county in a suit brought to recover on unpaid

coupons, holding that the defendant cannot collaterally question the regularity of the consolidation in this manner. The county had not raised the question in the manner provided by law, but had allowed the consolidation to take effect and could not now set up this defense.

Whitewater Valley.

This company gives notice that from March 9 all its passenger and freight business to and from Cincinnati will be done at the Indianapolis, Cincinnati & Lafayette depot in that city.

Its line into Cincinnati was formerly over that road, but for some time past it has had a connection with the Ohio & Mississippi at North Bend, and has sent its traffic into Cincinnati by that line.

Auction Sales of Railroad Securities.

In New York last week Cairo & Fulton first-mortgage bonds sold for 55 1/4; Suspension Bridge & Erie Junction first-mortgage, 60 1/4; Pennsylvania Coal Company stock, 247.

The Boston, Hartford & Chicago Line.

Another conference was held in New York, March 10, by the representatives of the Erie, the Dutchess & Columbia, the Connecticut Western, the Hartford, Providence & Fishkill, the Boston, Hartford & Erie and the Newburg Transfer companies. Preliminary arrangements for the organization of the proposed freight line between Boston and the West were agreed upon. Another meeting will be held soon to perfect the agreement and complete the running arrangements.

Sussex.

The roof of the large freight depot at Newton, N. J., fell in on the night of March 8, being unable to stand the great weight of snow resting on it. In its fall it carried along a large part of the walls and destroyed or badly damaged a large quantity of freight.

United States Rolling Stock Company.

An adjourned meeting of the stockholders is to be held at the office in New York, April 21, to receive the report of the committee appointed at the annual meeting.

European & North American.

This company has offered to build and work the proposed branch line from its Bangor & Piscataquis Division at Milo, Me., northward to Brownville, 10 miles, on condition that a loan of \$60,000 for 20 years, at 6 per cent., is raised for the company. The required amount has been nearly all subscribed.

Atlantic & Gulf.

The Governor of Florida has vetoed the bill authorizing this company to extend its Florida Division southward from Lake Oak.

Laurens.

This old road, which, we believe, has been abandoned since the war, was sold at judicial sale some months since, and was bought in in the interest of the South Carolina Railroad Company. Work on it is now in progress, the trestles which had rotted away are being rebuilt, the road-bed put in order and the track relaid. The road is 32 miles long, from the Greenville & Columbia at Newberry, S. C., west by north to Laurensville.

Old Colony.

This company has resolved to put the Miller platform and coupler on all its passenger equipment, and the change will be made as fast as possible.

Chicago & Illinois River.

The Chicago Tribune states that the negotiations for the sale of this road to the Chicago & Alton have been completed, and the papers will be signed in a few days. For a time the road will not be extended beyond its present terminus, 20 miles from Joliet. It will be run mainly as a coal road.

Philadelphia & Chester County.

This company has secured property for a depot in Philadelphia adjoining that of the West Chester & Philadelphia road at Twenty-first and Chestnut streets. A contract has been made for the use of the tracks of the Junction Railroad from that point to Gray's Ferry, thus securing an entrance into Philadelphia.

Fort Wayne, Muncie & Cincinnati.

All the Cincinnati business of this road and Fort Wayne, Jackson & Saginaw will hereafter be sent over the Cincinnati, Hamilton & Indianapolis and Cincinnati, Hamilton & Dayton roads from Cincinnati, Ind., to Cincinnati. Much of this business has heretofore gone over the Whitewater Valley road.

Montclair.

The trustees under the first mortgage give notice that over \$1,000,000 of the bonds have been deposited and request outstanding bondholders to deposit their bonds at once with the New York State Loan & Trust Company at No. 50 Wall street, New York, in order that they may take part in a meeting soon to be called to pass upon a plan of reorganization.

Burlington & Missouri River in Nebraska.

This company has begun a suit against the Union Pacific in the United States Circuit Court on a claim to 300,000 acres of land now in possession of the latter company.

Toledo, Peoria & Warsaw.

The Receiver, Mr. A. L. Hopkins, has submitted to the Circuit Court a full and elaborate report on the condition of the road and upon the outstanding contracts of the company.

The Court received the report and directed the Receiver to make a new contract with the Chicago, Burlington & Quincy for the use of the road from Iowa Station to the Mississippi and the Burlington Bridge and to reopen the branch to Burlington, provided he deems it profitable to do so. The Receiver is also authorized to use the net earnings to put the road in good order; to amend and discontinue in his discretion the contracts with the National Car Company; and to compromise claims for rent due from the Chicago, Pekin & Southwestern and the Toledo, Wabash & Western companies. All disputed claims are to be referred to H. W. Bishop, as Master, who is to investigate and report to the Court.

Rockford, Rock Island & St. Louis.

The Receiver reports to the Court for February, as follows:

Balance on hand January 31.....	\$25,435 29
Receipts in February.....	63,594 78
Total.....	\$89,970 07
Disbursements, including receiver's and attorney's allowances.....	67,958 88
Balance, February 28.....	\$21,011 19

Farmington & Squan Village.

This company has secured an amendment to its charter authorizing it to extend its road from Squan Village, N. J., north through Ocean Beach and Ocean Grove to Long Branch, about 12 miles. The road is worked by the Freehold & Jamesburg Company, which is controlled by the Pennsylvania.

Nevada Railroad Taxation.

The Nevada Legislature has passed an amendment to the tax law, which provides that county assessors shall hereafter assess railroad property at its full cash value as part of a continuous line of road, and not, as heretofore, at merely the

value of the land and material. This law will, it is said, make the taxes to be paid by the Central Pacific nearly three times what they now are. The taxes paid by that company last year in Nevada were about \$125,000.

Train Accidents in February.

On the morning of the 1st, the tender and two cars of a passenger train on the New Haven & Northampton road were thrown from the track at Plainville, Conn., by a broken switch rod, and ran into the caboose of a freight train, damaging it somewhat.

On the 1st, a freight train on the New Haven & Northampton road ran off the track at Collinsville, Conn., damaging several cars and blocking both its own track and that of the Connecticut Western, which are at that point side by side.

On the evening of the 1st, some cars of a freight train on the Vermont Central road ran off the track near Stanbridge, V. Q., blocking the road some hours.

On the night of the 1st, an express train on the Chicago, Burlington & Quincy struck a broken frog at Meriden, Ill. The engine passed over, but all the rest of the train left the rails.

Early on the morning of the 2d, a train on the New London Northern road ran off the track at Hayden's Crossing, Conn., blocking the road several hours.

On the morning of the 2d, a driving-axle broke under the engine of a passenger train on the New London Northern road, near Williamstown, Conn., delaying the train some time.

On the 2d, an inside connected engine on a train on the New York Branch of the Erie broke the crank axle near Paterson, N. J., delaying the train some time.

On the afternoon of the 2d, the mail train on the Chicago & Michigan Lake Shore road ran off the track near St. Joseph, Mich., during a heavy snow storm.

On the night of the 2d, a west-bound express train on the Midland Pacific road was thrown from the track near Bennet, Neb., by a broken rail. Two cars went down the bank and were completely wrecked, and eight persons were injured.

On the morning of the 3d, on the Syracuse Northern road, near Sandy Creek, N. Y., there was a butting collision between a north-bound passenger train and a south-bound engine with a lot of laborers on board. Both engines were badly wrecked and 14 persons injured, only one of whom was on the passenger train.

On the evening of the 3d, four cars of a freight train on the Toledo, Peoria & Warsaw road were thrown from the track by a broken rail near Sciota, Ill.

On the evening of the 3d, as a train on the Hempstead Branch of the Southern Railroad of Long Island was approaching Woodfield, N. Y., it struck a place where the road-bed had been washed out by water which had accumulated during a heavy storm, and which an insufficient culvert had failed to carry off. The engine and one car left the track and rolled over, and the boiler exploded. Four men who were on the engine were killed and four others in the car badly hurt.

On the night of the 3d, near Oswego, Ill., on the Fox River Valley Branch of the Chicago, Burlington & Quincy Railroad, several cars of a freight train were thrown from the track by the breaking of a truck, and some of them fell upon the ice which covered Fox River.

Very early on the morning of the 4th a passenger train on the Lake Shore & Michigan Southern road was thrown from the track in East Buffalo, N. Y., by ice which had collected in a frog.

Early on the morning of the 4th, the first section of an east-bound freight train on the Pittsburgh, Cincinnati & St. Louis road struck a broken rail near Cadiz Junction, O., and the five rear cars ran off the track and were badly broken up, injuring a boy fatally and two train men badly.

A few minutes afterwards the second section came up at a good speed and ran into the wreck, and the engine and 13 cars were piled up on the track and broken up. The track was cleared in five hours.

On the morning of the 4th, the engine of a mixed train on the Harlem Extension road ran off the track near Manchester, Vt.

Near noon on the 4th a train on the Rome & Clinton Branch of the New York & Oswego Midland ran off the track in a snow drift at Bartlett, N. Y.

On the 4th a snow plow on the Rome, Watertown & Ogdensburg road was thrown from the track in a heavy snow drift at McConnellsville, N. Y.

On the same day another plow on the same road ran off the track in a drift at West Camden, N. Y.

On the 4th two cars of a passenger train on the Harlem Extension road were thrown from the track by a broken rail near Chatham, N. Y.

On the 4th an express train on the Grand Rapids & Indiana road ran into the rear of another passenger train which was standing on the track at Morley, Mich., wrecking a car. The preceding train was four hours behind time, but there do not seem to have been any signals up at the station.

On the afternoon of the 4th there was a butting collision between two passenger trains on the Southwestern Division of the Chicago, Rock Island & Pacific, near Eldon, Ia., by which both engines were badly wrecked and several cars damaged. An engineer, a fireman and the express messenger were hurt. Both trains were running on telegraphic orders, but it is said that an order for the east-bound train to wait for the other at Ashland was not delivered.

On the evening of the 4th on the Chicago & Alton, near Bridgeport, Ill., the engine of a passenger train was thrown from the track during a heavy snow storm.

On the night of the 4th as a train drawn by two engines on the Detroit & Milwaukee road was approaching Spring Lake, Mich., the forward engine jumped the track and went down a bank, leaving the track entirely clear, so that the other engine and the train passed on. There was a heavy snow falling at the time.

Early on the morning of the 5th a freight train, on the Morris & Essex Division of the Delaware, Lackawanna & Western, ran off the track near the entrance to the Hoboken yard. One of the cars was upset, and crushed a switch-tender's house, injuring him badly.

Early on the morning of the 6th, near Millville, Ill., on the Quincy, Alton & St. Louis road, three freight cars of a mixed train were thrown from the track by a broken rail, blocking the road three hours. The rail, which is supposed to have been broken by the engine, was found to be in five pieces.

On the morning of the 5th a wild engine on the Michigan Central was thrown from the track near Jackson, Mich., by a broken driving-wheel, and the engineer was badly hurt.

On the 5th, a freight car on the Carondelet Branch of the Missouri Pacific road ran off the track in Carondelet, Mo.

On the afternoon of the 5th a passenger train on the Indianapolis, Cincinnati & Lafayette road ran into a freight train on the Louisville, New Albany & Chicago at the crossing of the two roads near Lafayette, Ind. Three cars and the engine were badly wrecked.

On the evening of the 5th the engine of a passenger train on the Southern Railroad of Long Island was thrown from the track near Jamaica, N. Y., by the breaking of a truck axle.

On the night of the 5th, near Holmes, Ind., on the Indianapolis, Cincinnati & Lafayette road an axle broke under a sleeping coach, delaying the train some time.

Early on the morning of the 6th, the baggage car and two coaches of a train on the Albany & Susquehanna road were thrown from the track near Binghamton, N. Y., by a broken

rail. One coach went down a bank 30 feet high and was badly broken up.

Early on the morning of the 6th, on the Erie Railway, near Greenwood, N. Y., a truck broke under a stock car in a freight train, throwing three cars from the track and blocking the road some time.

On the morning of the 6th, a freight train on the Atchison, Topeka & Santa Fe road struck a broken rail near Topeka, Kan., and eight cars left the track, three of them being badly wrecked.

On the afternoon of the 6th, a passenger train on the Portland & Rochester road ran off the track near the depot in Portland, Me.

On the night of the 6th there was a collision between a Jeffersonville, Madison & Indianapolis engine and an Indianapolis, Bloomington & Western switch engine in Indianapolis, Ind., by which both were considerably damaged.

Shortly after midnight on the 7th, at Clarence, Mo., on the Hannibal & St. Joseph road, the rear car of a passenger train was thrown from the track by a broken rail and upset.

Very early on the morning of the 7th, a passenger train on the Missouri Pacific road struck a broken rail at Bridge No. 30, near Osage, Mo., and all the cars left the track. They ran across the bridge, 70 feet, on the ties, when two of them upset and a third broke loose and went down a bank, turning over once and stopping right side up 60 feet from the track and 20 feet below it. The car was badly broken and 15 persons were more or less hurt.

On the morning of the 7th, a west-bound express train on the Columbus, Chicago & Indiana Central struck a broken rail near Richmond, Ind., and the whole train left the track, the engine and baggage car being badly hurt.

On the morning of the 7th, a broken rail near Embarrass, Ill., on the Indianapolis & St. Louis road, threw several cars of a freight train from the track.

On the morning of the 7th, as an express train on the Chicago, Burlington & Quincy was near Hawthorne, Ill., the connecting rod broke and one end was thrown up against the cab, breaking it up and tearing a hole in the boiler. The engineer and fireman were both scalded.

On the 7th, as a train on the Jefferson Branch of the Erie Railway was near Forest City, Pa., a driving wheel broke under the engine, throwing it and the baggage car from the track.

On the morning of the 8th, eight cars of a freight train on the Norwich & Worcester road were thrown from the track near Greenville, Conn., by ice on the track.

On the morning of the 8th, on the Indianapolis, Bloomington & Western road, near Claremont, Ind., several cars of a freight train were thrown from the track by a broken rail.

On the morning of the 8th, a broken rail threw from the track several cars of an express train on the Indianapolis, Bloomington & Western road near Indianapolis, Ind.

On the 8th, on the Central Pacific, an engine ran off the track at the depot in Sacramento, Cal.

On the afternoon of the 8th, on the Cincinnati, Hamilton & Dayton road, in Cincinnati, O., the engine of a passenger train was thrown from the track and upset by the breaking of the truck. The baggage car was also thrown off the track and a brakeman hurt.

On the night of the 8th, a freight train on the Chicago, Milwaukee & St. Paul road ran off the track at Winona Junction, Wis., and the engine and several cars were wrecked. The accident was caused by a broken switch.

On the night of the 8th, the sleeping coach of a passenger train on the Cincinnati, Lafayette & Chicago road ran off the track near Kankakee, Ill., blocking the road eight hours. The accident was caused by a broken axle.

On the night of the 8th, an east-bound passenger train on the Columbus, Chicago & Indiana Central road was thrown from the track by a broken rail near Logansport, Ind.

Early on the morning of the 9th, the second section of a freight train on the Chicago & Alton road ran into the rear of the first section at Dwight, Ill., breaking up several cars and injuring the engineer and a brakeman.

On the morning of the 9th, a train on the Utica Division of the Delaware, Lackawanna & Western road was thrown from the track by a broken rail near Greene, N. Y.

On the morning of the 9th, an engine on the Illinois Central exploded its boiler at Apple River, Ill., severely injuring the engineer and fireman.

On the morning of the 9th, four cars of a mixed train on the Nashua & Rochester road were thrown from the track and badly wrecked near Windham, N. H., and a brakeman badly hurt. The accident was caused by some lumber falling from a flat car upon the track.

On the morning of the 9th, on the Norwich & Worcester road, near North Oxford, Mass., the engine of a passenger train was thrown from the track by ice which had gathered over the rails.

On the morning of the 9th, several cars of a freight train on the Missouri Pacific road were thrown from the track by a broken rail near Chamois, Mo., and some of them were badly broken up.

On the morning of the 9th, a passenger train on the St. Louis, Kansas City & Northern road struck a broken rail near Lexington Junction, Mo., and all the cars left the track, blocking the road three hours.

On the morning of the 9th, on the Valley Branch of the Baltimore & Ohio, at Shensandah City, Va., a stock train ran over a misplaced switch and into the head of a freight train which was standing on the siding. Both engines and several cars were damaged and some stock killed.

On the morning of the 9th, on the Maine Central, near Carmel, Me., a car in a passenger train was thrown from the track by a broken wheel.

On the morning of the 9th, a north-bound passenger train on the Milwaukee Division of the Chicago & Northwestern struck a broken rail near Ives, Wis., and the engine and three cars left the track and were considerably damaged.

On the evening of the 9th, a passenger train on the Wisconsin Central road ran off the track in a cut near Waldo, Wis., and the cars with one of the two engines were thrown up against the bank. There was heavy snow at the time. The road was blocked an entire day.

On the evening of the 9th, a freight train on the Wisconsin Central road ran off the track north of Stevens Point, Wis.

On the night of the 9th, a train on the Jeffersonville, Madison & Indianapolis road ran off the track near Columbus, Ind., blocking the road three hours.

On the morning of the 10th, on the Boston, Hartford & Erie road near Norwood, Mass., an inside-connected engine on a passenger train broke the crank-axle, delaying the train four hours.

On the morning of the 10th, at South River, Mo., on the Hannibal Branch of the Mississippi Valley & Western road a switch connection broke, throwing the baggage car and coach off the track and delaying the train several hours.

On the morning of the 10th, the tender of a train on the Woonsocket Division of the Boston, Hartford & Erie was thrown from the track near North Bellingham, Mass., by a broken axle.

On the morning of the 10th, on the Rockford, Rock Island & St. Louis road, at Edwardsville, Ill., the two rear cars of a passenger train were thrown from the track by a broken switch rod and ran into the head of a freight train standing on a siding. Both cars and the freight engine were badly broken and four persons hurt.

On the 10th, a driving axle broke under the engine of a passenger train on the Cincinnati, Hamilton & Indianapolis road near Rushville, Ind., delaying the train some time.

On the 10th, a freight train on the Southern Minnesota ran

off the track near Rushford, Minn., during a heavy snow storm.

On the afternoon of the 10th, the engine of a passenger train on the Erie Railway broke a connecting rod near Passaic, N. J., delaying the train some time and damaging the engine.

On the evening of the 10th, on the Oil Creek & Allegheny River road, near Titusville, Pa., the two rear cars of a passenger train were thrown from the track by a broken rail and badly wrecked, injuring six persons severely.

On the evening of the 10th, a car of a passenger train on the New Haven & Northampton road was thrown from the track in New Haven, Conn., by a broken wheel.

On the night of the 10th, on the Baltimore & Ohio road, near Hancock, Md., there was a butting collision between two coal trains by which both engines and a number of coal hoppers were wrecked. The accident was caused by shifting an east-bound train upon the wrong track at Sir John's Run, owing to a misapprehension of telegraphic orders.

Very early on the morning of the 11th, an express train on the St. Louis, Iron Mountain & Southern road struck a broken rail near Bismarck, Mo., and three cars left the track and went down a bank, injuring the express agent and four passengers.

On the morning of the 11th, a train on the St. Paul & Pacific road ran off the track at Itasca, Minn., and two cars were wrecked.

On the morning of the 11th, as a train on the Morris & Essex Division of the Delaware, Lackawanna & Western was near East Newark, N. J., the driving axle broke and the engine was thrown from the track.

On the morning of the 11th the engine of the Shamokin passenger train on the Philadelphia & Reading road ran off the track near Tuscarora, Pa., in a heavy snow storm.

On the morning of the 11th the engine of a passenger train on the Philadelphia & Reading road ran off the track in a snow drift near Tamaqua, Pa.

On the morning of the 11th, on the Ohio & Mississippi road, near Vincennes, Ind., a trestle gave way under a freight train and a number of cars fell through. The caboose took fire from the stove and was burned with two other cars. A brakeman was badly hurt.

On the morning of the 11th, as a coal train was going down the Maryland Coal Company's inclined plane near Lonsconing, Md., the rope broke and the cars ran down the incline at a great speed and through the dump at its foot, wrecking the cars and killing a man who was on board. Two other men jumped and were badly hurt.

On the morning of the 11th a south-bound freight train on the Illinois Central struck a broken rail near Jonesboro, Ill., throwing a number of cars from the track, and five of them were piled up across the road and badly broken.

Near noon on the 11th a freight train on the Illinois Central ran over a misplaced switch at Anna, Ill., and into the rear of another freight which was standing on the siding, wrecking the caboose.

On the 11th, at Shabbona, Ill., on the Rock Falls Branch of the Chicago, Burlington & Quincy, an engine and tender were thrown from the track by a broken rail, causing much trouble. On the 11th the engine of a coal train on the Philadelphia & Reading road ran off the track in a snow drift near Tuscarora, Pa.

On the 11th, the tender of a freight train on the New York, New Haven & Hartford road was thrown from the track near Meriden, Conn., by broken wheels.

On the afternoon of the 11th, a freight train on the Keokuk & Des Moines road was thrown from the track by a broken rail near Polk, Ia., blocking the road several hours.

On the evening of the 11th, a freight train on the Fox River Valley Branch of the Chicago, Burlington & Quincy ran into a Chicago, Rock Island & Pacific passenger train at the crossing of the two roads at Ottawa, Ill. The freight engine was damaged, one passenger car wrecked and a brakeman badly hurt. There was a heavy snow-storm at the time, making it very difficult to see the signals for any distance.

On the evening of the 11th, a train on the Memphis & Charleston road ran off the track at Germantown, Tenn., blocking the road all night.

On the night of the 11th, a freight train on the Keokuk & Des Moines road struck a broken rail near Vincennes, Ia., and nine cars left the track and went down a bank 16 feet high, most of them being badly wrecked. The conductor was badly hurt.

On the night of the 11th, a freight train on the Missouri, Kansas & Texas road ran off the track near Fort Scott, Kan., wrecking several cars.

Very early on the morning of the 12th, a passenger train on the Illinois Midland road struck a broken rail on the trestle bridge over Wild Cat Creek, near Redmon, Ill., and the baggage car and passenger coach went off the track and fell from the trestle upon the ice of the creek. Both cars were completely wrecked and 12 persons were injured, including Master Mechanic Clifford, who was on board.

Very early on the morning of the 12th, an accommodation train on the Toledo, Peoria & Warsaw struck a broken rail near Sciota, Ill., and two freight cars and the caboose ran off the track and down a bank. The caboose was badly broken, and four persons hurt.

Early on the morning of the 12th, a train on the Bloomfield Branch of the Delaware, Lackawanna & Western road was thrown from the track near Bloomfield, N. J., by ice on the rails.

Early on the morning of the 12th, two cars of a passenger train on the Missouri Pacific road were thrown from the track on a high bank near Washington, Mo., by a broken rail.

Early on the morning of the 12th, on the Indianapolis & St. Louis road, near Gillespie, Ind., the sleeping coach of an express train was thrown from the track by a broken rail. The car was badly damaged.

Early on the morning of the 12th, on the New York Division of the Pennsylvania Railroad, near Uniontown, N. J., the rear car of the newspaper train from New York to Philadelphia was thrown from the track and badly broken. The cause of the accident is said to have been ice on the track.

Early on the morning of the 12th, on the Erie Railway near Ridgewood, N. J., an east-bound freight train broke in two and the rear part subsequently ran into the forward cars, wrecking several cars and killing a brakeman.

On the morning of the 12th, an east-bound freight train on the California Pacific road ran into the head of a passenger train which was stopping at Batavia, Cal., damaging the engine and several cars. There was a dense fog at the time.

On the morning of the 12th, at Berlin, Ill., on the Toledo, Wabash & Western Railway, a switch connection broke under a freight train, letting seven cars off the track and blocking the road three hours.

On the morning of the 12th, a passenger train on the Peoria & Rock Island road was thrown from the track by a broken rail near Princeville, Ill., and one car went down a bank and upset, injuring five passengers seriously besides a number slightly.

On the morning of the 12th, a train on the New Haven & Northampton road ran off the track near New Haven, Conn., blocking the road two hours.

On the 12th, a freight train on the Keokuk & Des Moines road was thrown from the track near Ottumwa, Ia., by a broken truck.

On the 12th, seven freight cars and a caboose of a train on the Keokuk & Des Moines road were thrown from the track and went down a bank by a broken rail near Des Moines, Ia. Three men who were in the caboose were injured.

On the 12th, a parallel rod on the engine of a passenger train

on the Vermont Central road broke at Bethel, Vt., and threw the engine and three cars from the track.

On the afternoon of the 12th, a broken wheel threw three cars of a freight train from the track at Smoky Hollow, Ia., on the Keokuk & Des Moines road, blocking the road ten hours.

On the afternoon of the 12th, a switching engine on the Burlington, Cedar Rapids & Minnesota jumped the track in the Burlington, Ia., yard.

On the evening of the 12th, the engine of a train on the Syracuse & Chenango road ran off the track in a snow drift near Cazenovia, N. Y., and the fireman was killed.

On the night of the 12th, three cars of a freight train on the Jeffersonville, Madison & Indianapolis road were thrown from the track and wrecked near Jonesville, Ind.

Early on the morning of the 13th, on the Erie Railway near Ramapo, N. Y., an axle broke under a car of a freight train, throwing the car from the track and wrecking it badly.

Early on the morning of the 13th the east-bound Pullman train on the Eastern Railroad struck a broken rail near Kennebunk, Me., and seven cars were thrown from the track, delaying the train several hours.

On the morning of the 13th, four cars of a passenger train on the Little Miami road were thrown from the track near Columbus, O., by the breaking of a truck.

On the morning of the 13th a train on the West Wisconsin road ran over a broken rail at Elk Mound, Wis., and three cars were thrown from the track.

On the morning of the 13th, on the Illinois Central near Kankakee, Ill., a car and the caboose of a freight train were thrown from the track by a broken rail, blocking the road several hours.

On the afternoon of the 13th, the engine of a passenger train on the New York Division of the Pennsylvania Railroad broke a connecting rod near East Newark, N. J., damaging the engine and delaying the train some time.

On the afternoon of the 13th, a train on the Providence & Worcester road was thrown from the track near Providence, R. I., at a place where a track gang had removed a rail for repairs and had neglected to put out the proper signal.

On the afternoon of the 13th, the engine of a passenger train on the New York, New Haven & Hartford road broke a driving axle near Noroton, Conn., delaying the train three hours. The axle, which was of steel, was broken in two places, letting both of the forward drivers loose, but the engine did not leave the track.

On the evening of the 13th seven cars of a freight train on the St. Paul & Sioux City road were thrown from the track near Le Sueur, Minn., by a broken rail.

On the night of the 13th, as a freight train on the Missouri, Kansas & Texas road was near Fort Scott, Kan., the center pin of a truck broke, letting one end of the car down on the track, and 22 cars were piled up and badly wrecked.

On the 14th, a train drawn by two engines on the Riviere du Loup Division of the Grand Trunk went through a bridge at Trois Saumons, P. Q., both engines with a snow-plow and the baggage car going down into the river. Both engineers and one fireman were killed. The bridge was being repaired and the carpenters had put out a signal, but the engineer failed to see it on account of the snow thrown up by the plow.

About 3 o'clock on the morning of the 15th, near South Lyon, Mich., on the Detroit, Lansing & Lake Michigan Railroad, a train of 21 freight cars drawn by two locomotives encountered a broken rail, by which one car of grain and nine loaded with stock were thrown down an embankment, killing 40 cattle and 125 sheep, and blocking the road twelve hours. The damage has been reported as \$20,000.

On the morning of the 15th, the engine of an east-bound passenger train on the Erie Railway broke the tire of one of the driving wheels, near Suffern, N. Y., and one of the pieces, striking the connecting rod, broke that also.

On the 15th, the engine and three cars of the west-bound mail train on the Pittsburgh, Fort Wayne & Chicago were thrown from the track near Van Wert, O.

On the 15th, a passenger train on the Sussex Railroad struck a broken rail near Newton, N. J., and the baggage car left the track, went down a bank 15 feet high and upset, injuring three persons somewhat. The car caught fire but was extinguished.

On the afternoon of the 15th, on the New York, Providence & Boston road, at Niantic, R. I., a box car in a freight train ran off the track, blocking the road two hours.

On the evening of the 15th a car of a freight train on the Jeffersonville, Madison & Indianapolis road was thrown from the track in Indianapolis, Ind., by a broken axle. The road was blocked two hours.

On the night of the 15th the engine and three cars of a freight train on the Burlington & Missouri River road were thrown from the track in Burlington, Ia., by a misplaced switch.

Very early on the morning of the 16th an east-bound express train on the Ohio & Mississippi was thrown from the track near Sumner, Ill., by a broken rail, and the two sleeping cars went down a high bank and upset, injuring 12 passengers. Both cars were badly damaged and both caught fire, but were put out promptly.

On the morning of the 16th, on the Providence & Worcester road, the engine of a local train broke a crank axle near Valley Falls, R. I., delaying trains some time.

On the morning of the 16th a car in a passenger train on the Morris & Essex Division of the Delaware, Lackawanna & Western was thrown from the track in Newark, N. J., by a broken axle.

On the 16th a car in a passenger train on the Indianapolis, Cincinnati & Lafayette road was thrown from the track by a broken wheel at Lawrenceburg, Ind.

On the evening of the 16th, on the Utica, Ithaca & Elmira road near Erin, N. Y., the passenger car of a mixed train broke loose, and the train being stopped it ran into the rear, injuring a brakeman and a passenger, and breaking itself badly. The shock broke a freight car loose, which started off down grade at a great speed, but was subsequently stopped without damage.

On the night of the 16th, the engine of a freight train on the Erie Railway broke a crank-pin when the train was near Paterson, N. J., delaying trains two hours.

On the morning of the 17th, a freight train on the Central Railroad of Georgia ran off the track and one car was badly wrecked, near Oliver, Ga.

On the morning of the 17th, a west-bound freight train drawn by two engines was thrown from the track of the Chicago, Rock Island & Pacific road at Depue, Ill., by a misplaced switch. Both the engines and four cars went into the ditch and were badly wrecked, and the road was blocked for 24 hours.

On the morning of the 17th, near Anderson's Ferry, O., on the Ohio & Mississippi road, four cars of a passenger train jumped the track and three of them upset. The accident was caused by a broken rail.

On the morning of the 17th, a passenger train on the Montclair road was thrown from the track near Woodside, N. J., by a broken rail, and one car was upset in the ditch.

On the morning of the 17th, there was a butting collision between a passenger and a freight train on the Morris & Essex Division of the Delaware, Lackawanna & Western road near Chatham, N. J., by which both engines were considerably damaged.

On the morning of the 17th, at Mendota, Ill., on the Chicago, Burlington & Quincy, a passenger train was unable to start owing to the slippery condition of the rails, and two switch engines were sent to the rear end of the train to help it out. Just after it started the forward engine struck a mis-

placed switch, went off the track and stopped; but the pushers kept on, forcing the baggage car up on the tender and breaking both considerably.

On the morning of the 17th, on the Burlington, Cedar Rapids & Minnesota road, a broken rail threw a freight train from the track near Cone, Ia.

A few hours afterward the same train again ran off the track at Ely, Ia.

On the 17th, at Blunt, Ill., on the Chicago & Iowa Railroad, a freight train was dived by a broken rail, blocking the road four hours.

On the afternoon of the 17th, on the Keokuk & Des Moines road, near Prairie City, Ia., a truck wheel broke under the engine of a passenger train, and before the train could be stopped it had broken 18 rails, but the train did not leave the track.

On the afternoon of the 18th a freight train on the Buffalo, New York & Philadelphia road was thrown from the track near Yorkville, N. Y., by a broken rail.

On the afternoon of the 18th the second section of a freight train on the New York Central & Hudson River road ran into the rear of the first section as it was stopping to take water at Canastota, N. Y., damaging the engine and caboose. It was snowing fast at the time.

On the night of the 18th several cars of a freight train on the Missouri Pacific road were thrown from the track near Laclede, Mo., by a broken rail, and three of them were badly wrecked.

On the night of the 18th a freight train, on the New York Division of the Pennsylvania Railroad, ran off the track at the Newark Avenue crossing in Jersey City, and the engine ran into the gate-keeper's house, smashing it and injuring the keeper.

About two o'clock on the morning of the 19th an east-bound train on the Pittsburgh, Cincinnati & St. Louis road struck a broken rail near Mingo Junction, O., and the baggage and two passenger cars, two sleeping coaches and the directors' car, which was on the train, left the track and went down a bank, several of the cars upsetting. The directors' car caught fire and all the cars were entirely destroyed. Mr. J. N. McCullough, General Manager, Wm. Stewart, General Freight Agent of the Pennsylvania Company, a brakeman and three passengers were severely hurt.

About three o'clock on the morning of the 19th an express train on the Kansas City, St. Joseph & Council Bluffs was running at a high speed to make up time, it ran into the rear of a preceding freight train near East Leavenworth, Mo., wrecking the engine and several cars and badly hurting the conductor and a passenger in the caboose of the freight. There was a dense fog at the time.

Very early on the morning of the 19th an express train on the New York Division of the Pennsylvania Railroad, struck a broken rail at East Brunswick, N. J., and the engine was thrown from the track, blocking the road three hours.

On the morning of the 19th, on the Rome, Watertown & Ogdensburg road, near West Camden, N. Y., a snow plow jumped the track, blocking the road several hours.

On the morning of the 19th the caboose of a freight train was thrown from the track by the spreading of the rails near Laclede, Mo., on the Missouri Pacific, delaying the train an hour.

On the morning of the 19th, at Evanston, Ill., on the Milwaukee Division of the Chicago & Northwestern road one freight train ran into the rear of another, damaging the engine and several cars.

About 9 o'clock on the morning of the 19th seven cars of a freight train on the Chicago, Burlington & Quincy were thrown from the track near Camp Point, Ill., by a broken rail. The section men knew that the rail was bad and had pieces cut to put in as soon as the train passed. Trains were delayed several hours and finally sent around by way of Clayton and the Toledo, Wabash & Western.

Near noon on the 19th, the tender of an express train on the New York Central & Hudson River ran off the track at Wampsville, N. Y., in a heavy snow storm.

On the afternoon of the 19th, a train on the Grand Tower & Carbondale road was thrown from the track on a trestle near Mount Carbon, Ill., by the spreading of the rails. Three freight and the passenger car went off and fell to the ground breaking them up and injuring two passengers severely besides a number slightly.

On the evening of the 19th, three cars of a passenger train on the Burlington & Keokuk Branch of the Chicago, Burlington & Quincy were thrown from the track by a broken switch rod near Fort Madison, Ia., damaging the cars badly and blocking the road all night.

On the morning of the 20th, three cars of a freight train on the St. Paul & Pacific road were thrown from the track near Wayzata, Minn., by a broken rail, blocking the road several hours.

On the 20th, a passenger train on the Burlington, Cedar Rapids & Minnesota road struck a broken rail near Ely, Ia., and two cars were thrown from the track.

On the afternoon of the 20th, a Delaware, Lackawanna & Western passenger train ran into two cars which had broken loose from an Erie coal train in the Bergen Tunnel, wrecking them and killing a brakeman who was on them. The rest of the coal train had passed out of the tunnel and the operator at the east end had signaled back "all clear" to the west end, allowing the passenger train to proceed.

On the afternoon of the 20th, a car of an excursion train on the North Pacific Coast road ran off the track at White's Hill, Cal.

The engine of the same train subsequently ran off the track at Taylorville, Cal., delaying the train three hours.

On the night of the 20th, a train on the Chicago, Rock Island & Pacific road struck a broken rail at Sheffield, Ill., and three coaches were thrown from the track, one of them going down a bank 15 feet high. One passenger was killed by jumping from the car and five were injured.

On the night of the 20th, the Ulster County express on the New York & Oswego Midland road ran off the track in a snow drift at Homewick, N. Y.

On the same night the engine of a train on the Ellenville Branch got off the track in a drift near Summitville, N. Y., and the engine was abandoned and froze up.

On the morning of the 21st, a car of a train on the North Pacific Coast road ran off the track at White's Hill, Cal., delaying the train some time. The same car had run off at the same point on the preceding day.

Very early on the morning of the 22d, as an express train on the Rutland road was running with two engines near Ludlow, Vt., an axle broke under the tender of the forward engine, throwing the second engine and several cars from the track. There was heavy snow on the track at the time.

On the 22d, the engine of an express train on the Rutland road broke a tire near Cavendish, Vt., disabling the engine and delaying the train some time.

Near noon on the 22d, as a passenger train on the New York Central & Hudson River road was backing into the depot at Syracuse, N. Y., the brakes failed to hold and the rear car ran through the end of the depot, knocking down part of the wall and damaging the car.

On the 22d the engine of a train on the New Haven & Northampton road blew out a cylinder head near Southington, Conn., delaying the train two hours.

On the afternoon of the 22d three cars of a freight train on the New London Northern road ran off the track at Thamesville, Conn., went over the bank and were badly damaged.

On the afternoon of the 22d the engine of a train on the Vermont Central road became stalled in a snow drift near Swan-

ton Junction, Vt., and when two engines sent to its assistance were drawing it out it ran off the track and laid in the ditch all night.

On the night of the 22d the engine of a train on the De Roit & Milwaukee road broke a piston rod near Nunica, Mich., breaking the running gear badly and delaying trains three hours.

On the morning of the 23d, as two engines with a snow plow were running northward on the Vermont Central road, the plow ran off the track in a drift at Nigger Crossing, Vt., and laid there three hours.

It was replaced, but ran off the track again a few miles further on, at Swanton Junction, and was disabled.

About two o'clock on the afternoon of the 23d, on the Hannibal & St. Joseph road, at Clarence, Mo., an east-bound passenger train ran into the head of a west-bound freight which was just getting ready to go upon the siding. Both engines were badly broken, a freight car thrown from the track, and the road blocked four hours. There was a very dense fog at the time, which prevented the signals being seen.

On the afternoon of the 23d, a west-bound passenger train on the East Pennsylvania Branch of the Philadelphia & Reading road ran over a misplaced switch and into the head of a freight train standing on the siding at Sheridan, Pa. Both engines were considerably damaged.

On the afternoon of the 23d, a tornado struck the town of Houston, Mo., on the Lexington Branch of the Missouri Pacific, and every car out of a train of 13, which had just stopped at the depot, was thrown from the track, several of them badly wrecked and one carried 70 feet from the track.

On the afternoon of the 23d, there was a butting collision between two freight trains on the Chicago, Rock Island & Pacific road, between Atalissa and West Liberty, Ia., by which both engines were almost completely destroyed, and several cars telescoped and badly broken. A brakeman was killed and both engineers slightly hurt. The accident is said to have been caused by a mistake of the train-dispatcher, who ordered the east-bound train to meet the other at Atalissa, and then, forgetting what he had done, ordered the west-bound train forward to West Liberty.

On the evening of the 23d, a train on the Hartford, Providence & Fishkill road was thrown from the track at Wheaton's, Conn., by a misplaced switch. The switch had been opened by a track gang which was at work there, but a white flag was displayed nevertheless.

On the night of the 23d, a freight train on the Chicago, Rock Island & Pacific road struck a broken rail at Dutchman's Grade, near Davenport, Ia. The couplings broke and the forward part of the train went ahead, the rear car of this portion having the rear truck knocked out from under it. In this position, with one end resting on the forward truck and the rear end sliding over the rails, it is said to have been dragged over two miles.

On the night of the 23d, near Summit, Cal., on the Central Pacific, five cars of a freight train were thrown from the track, blocking the road some time.

On the morning of the 24th, an east-bound train on the Galveston, Harrisburg & San Antonio road ran off the track near Richmond, Tex., blocking the road a whole day.

On the morning of the 24th, a car of a passenger train on the Southern Railroad of Long Island, ran off the track near Jamaica, N. Y.

On the 24th, a train on the New Jersey Midland ran off the track at Smith's Mills, N. J., blocking the road some time.

On the 24th, as a freight train on the Central Railroad of Iowa, drawn by two engines, was crossing a bridge near Grinnell, Ia., the second engine with several cars was thrown from the track by the spreading of the rails and broke through the bridge, falling 30 feet upon the ice below. The engineer, fireman and a brakeman were badly hurt.

On the 24th, on the Cleveland, Columbus, Cincinnati & Indianapolis road near Galion, O., an axle broke under the engine of a passenger train, delaying the train some time.

On the night of the 24th, the caboose of a freight train on the Jackson, Lansing & Saginaw jumped the track near the bridge over Cedar River in Lansing, Mich., and rolled down the bank upon the ice. The car caught fire and was burned up.

On the night of the 24th, a passenger train on the Lexington Branch of the Missouri Pacific ran over a steer near Houston, Mo., throwing the baggage car from the track.

On the morning of the 25th the engine, mail and baggage cars of a westbound train on the Indianapolis, Bloomington & Western road were thrown from the track by a broken rail at Jamestown, Ind., the baggage car being badly broken.

On the morning of the 25th, several cars of a West Wisconsin freight ran off the track near Stillwater Junction in St. Paul, Minn.

On the afternoon of the 25th, a freight train on the Erie Railway ran into the rear of a preceding train at Clifton, N. J., damaging the engine and the caboose. There was a dense fog at the time.

On the afternoon of the 25th, a broken connecting rod threw a train on the Indianapolis, Bloomington & Western road off the track near Peoria, Ill. Several cars were upset and six passengers hurt.

On the evening of the 25th, a freight train on the Chicago, Rock Island & Pacific broke in two near Peru, Ill., and the rear section was run into by a following train. An engine and several cars were wrecked.

On the morning of the 26th, the engine of a freight train on the Baltimore & Ohio road ran off the track near Baltimore, injuring the fireman and blocking the road several hours.

On the morning of the 26th, on the Burlington, Cedar Rapids & Minnesota, the tire on the driving-wheel of an engine broke near Wapello, Ia., delaying the train some time.

On the 26th, near Grand Haven, Mich., on the Michigan Lake Shore road, two engines which had been sent to the assistance of a snow-blocked train ran off the track in the snow.

On the 26th, a train on the Wilmington, Columbia & Angusta road ran into a lot of cattle on a trestle near Grov wood, S. C., and the engine, express and baggage cars were thrown from the track. The engineer and express messenger were injured.

On the evening of the 26th, a Winona & St. Peter train ran into a Milwaukee & St. Paul freight at the crossing of the two roads near Winona, Minn., wrecking a freight car.

On the night of the 26th, a car in a freight train on the Keokuk & Des Moines road broke a wheel at Four Mile Bridge, near Des Moines, Ia., and seven cars off the track and went through the bridge, carrying down six spans of it upon the ice below. Two cars were entirely destroyed, the rest badly broken.

Very early on the morning of the 27th, near Wilmington, Ill., on the Chicago & Alton road, a freight train ran off the track, blocking the road some hours.

On the morning of the 27th, two cars of a freight train on the Peoria, Pekin & Jacksonville road were thrown from the track near Chandlerville, Ill., by a broken rail.

On the 27th, a west bound passenger train on the Lehigh Valley road was thrown from the track at Penn Haven, Pa., by the breaking of a guard rail. The engine was thrown across the track, and the tender and baggage car left the rails. The engineer and fireman were badly scalded.

On the 27th, a passenger train on the Jacksonville, Pensacola & Mobile road was thrown from the track near Ellaville, Fla., where a rail had been removed from the track by parties unknown. A passenger coach was completely wrecked and 26 passengers more or less hurt.

On the afternoon of the 27th, a train on the Erie Railway

ran over a misplaced switch and upon a high coal siding at Bergen, N. J., and the engine ran off the end of the siding, fell to the ground and was badly damaged.

On the evening of the 27th, a freight train on the Wallkill Valley Railroad broke through a wooden bridge near Montgomery, N. Y., and several cars fell into the stream and were badly wrecked.

On the evening of the 27th, a local passenger train on the Pennsylvania road ran into a freight which was just going upon a side track at Millvale, Pa., badly wrecking an engine and two cars.

On the evening of the 27th an express train on the Boston & Albany road ran off the track near Middlefield, Mass.

On the night of the 27th an engine on the Cairo & St. Louis road was thrown from the track by a misplaced switch at Jonesboro, Ill.

On the night of the 27th a rail broke under a passenger train on the Peoria, Pekin & Jacksonville road, near Bath, Ill., and the rear coach ran off the track and went down a bank 30 feet high, breaking itself badly and injuring eight persons.

On the 28th a car in a freight train on the Keokuk & Des Moines road was thrown from the track near Des Moines, Ia., by a broken truck.

This is a total of 211 accidents, whereby 11 persons were killed and 186 injured. Eight accidents caused the death of one or more persons, 36 others injury, but not death, while 167, or 79 per cent. of the whole, caused no serious injury to any person.

These accidents may be classified according to their nature and causes as follows:

COLLISIONS.	
Rear collisions.....	13
Butting collisions.....	9
Crossing collisions.....	4
	— 26

DERAILMENTS.	
Unexplained.....	35
Broken rail.....	53
Snow or ice.....	24
Broken wheel.....	9
Broken axle.....	8
Broken truck.....	8
Broken switch-bar.....	6
Misplaced switch.....	6
Broken bridge or trestle.....	3
Spreading of rails.....	3
Broken connecting rod.....	2
Rail removed.....	2
Cattle on track.....	2
Broken frog.....	1
Accidental obstruction.....	1
Defective brakes.....	1
Wind.....	1
Runaway train.....	1
Washout.....	1
	— 167

Broken axle.....	8
Broken tire.....	3
Broken connecting-rod.....	3
Broken crank pin.....	1
Broken piston rod.....	1
Boiler explosion.....	1
Cylinder head blown out.....	1
	— 21

Total..... 211

Four collisions were caused by fog preventing signals from being seen—which would seem to call for more extended use of torpedoes—four by misunderstanding of orders, three by misplaced switches, three by trains breaking in two and one by the failure to send out signals. We are again obliged to record an inexcusable, but very common piece of negligence—the failure of trackmen to put out signals when a rail is removed for repairs; one rail was removed maliciously, with intent to wreck the train. Defects or failures of permanent way caused 66 accidents and of equipment 48 accidents.

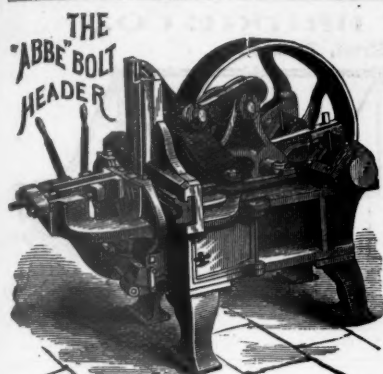
The number of accidents for the month is very large, the largest we have ever recorded, and much more than twice as large as for any month of the past year, with one exception. The intense cold and frequent storms of the month, probably the hardest for many years, have had much to do with this. Of accidents recorded as caused directly by the weather, as snow or ice on the track, there are 24, and probably a number of the unexplained derailments should come under the same head. The enormous number of broken rails, 25 per cent. of the whole, are partly a result of the weather, but partly also, without doubt, of the unwise but in many cases enforced economy of the past year, the failure to keep up the road-bed and to make renewals of iron where needed. A very noticeable feature is the small number of deaths caused, the number injured being about the average, comparatively. The average for the year is 0.16 killed and 0.81 injured per accident, while for the month it is 0.05 killed and 0.88 injured. It is probable that, in view of the unusually difficult circumstances of the month, there has been a pretty general diminution of train speed and unusual care in running, which, while it could not prevent the accidents, have made their results less fatal.

Comparing the month with February, 1874, we find an increase of 121, or 134.4 per cent., in the number of accidents; a decrease of 14, or 56 per cent., in the number killed, and an increase of 137, or 279.6 per cent., in the number injured. The record of the month is not very encouraging, certainly, but it is perhaps not quite so bad as might have been expected.

For the twelve months ending with February the record is as follows:

	No. of accidents.	Killed.	Injured.
March.....	88	13	49
April.....	50	3	13
May.....	80	10	51
June.....	83	22	55
July.....	64	20	104
August.....	73	16	77
September.....	60	27	105
October.....	51	16	69
November.....	82	13	69
December.....	74	12	49
January.....	131	10	90
February.....	211	11	186
Totals.....	1,124	182	913

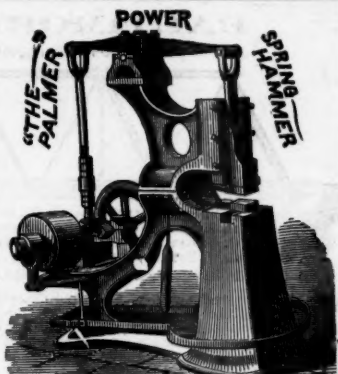
This is an average per day for February of 7.54 accidents, 0.30 killed, and 6.64 injured; for the year of 3.08 accidents, 0.50 killed, and 2.50 injured. The average daily number of accidents for the month is two and one-half times that for the year, of killed four-fifths, and of injured two and two-thirds that of the year.



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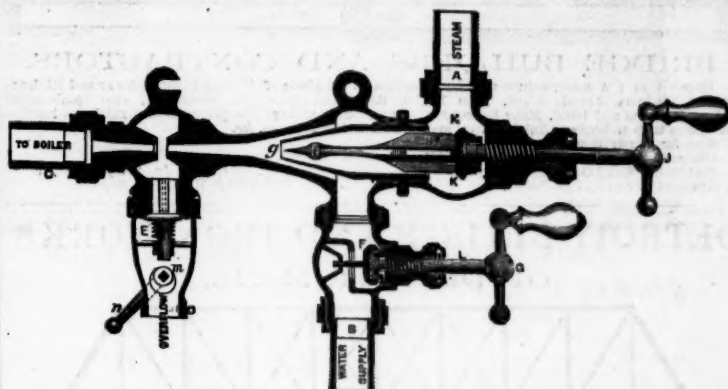


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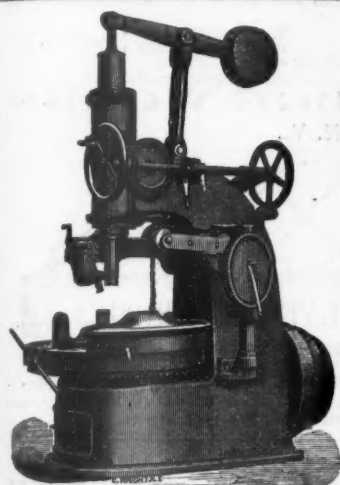
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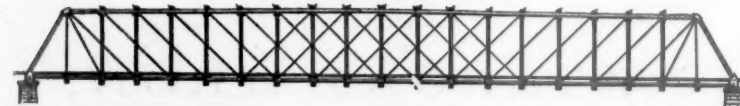
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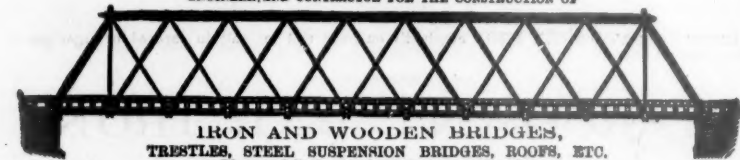


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